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1.0 PROJECT OBJECTIVES

1.0.1 The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for civilian sector projects that perform similar functions to the military projects. For example, a Company Operations Facility has the similar function as an office/warehouse in the civilian sector; therefore the design and construction practices for a company operations facility should be consistent with the design and construction of an office/warehouse building.

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
General Purpose Warehouse	Distribution Warehouse

1.0.2 It is the Army's objective that these buildings will have a 50 year useful life. The design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that time period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project OWNER. The facility design should consider that the Army may repurpose the use of the facility over the 50 year life. The Army's intent is to install products and materials of good quality that meet industry standard average life that corresponds with the period of performance expected before a major renovation or repurpose. The design should be flexible and adaptable to possible future uses different than the current to the extent practical while still meeting the operational and functional requirements defined within. Flexibility is achieved through design of more flexible structural load-bearing wall and column system arrangements. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles. Develop the project site for efficiency and to convey a sense of unity or connectivity with the adjacent buildings and with the Installation as a whole.

1.0.3 Requirements stated in this contract are minimums. Innovative, creative, and life cycle cost effective solutions, which meet or exceed these requirements are encouraged. Further, the OFFEROR is encouraged to seek solutions that will expedite construction (panelization, pre-engineered, etc.) and shorten the schedule. **The intent of the Government is to emphasize the placement of funds into functional/operational requirements. Materials and methods should reflect this by choosing the most economical Type of Construction allowed by code for this occupancy/project allowing the funding to be reflected in the quality of interior/exterior finishes and systems selected.**

1.1. SECTION ORGANIZATION

This Section is organized under 6 major "paragraphs".

- (1) Paragraph 1 is intended to define the project objectives and to provide a comparison between the military facility(ies) and comparable "civilian" type buildings.
- (2) Paragraph 2 describes the scope of the project.
- (3) Paragraph 3 provides the functional, operational and facility specific design criteria for the specific facility type(s) included in this contract or task order.
- (4) Paragraph 4 lists applicable industry and government design criteria, generally applicable to all facility types, unless otherwise indicated in the Section. It is not intended to be all-inclusive. Other industry and government standards may also be used, where necessary to produce professional designs, unless they conflict with those listed.
- (5) Paragraph 5 contains Army Standard Design Criteria, generally applicable to all facility types, unless otherwise indicated in the Section.
- (6) Paragraph 6 contains installation and project specific criteria supplementing the other 5 paragraphs.

2.0 SCOPE

Design and Construct a General Purpose Warehouse (GPW) and associated site work. The Warehouse shall store Class 2, Class 4, Class 5 and Class 9 supplies, as defined by AR 700-8. The warehouse is intended to be similar, both functionally and technically to warehouse facilities in the private sector within the surrounding community. The warehouse shall also facilitate some small assembly/maintenance operations.

Design and Construction of Vehicle Storage Yards and supporting roadways. The Vehicle Storage Yards shall provide secured storage areas for tactical vehicles, containers, and maintenance shelters. Vehicle Storage Yards shall also support unit training missions.

Site Preparation and Construction of Rainier Drive re-alignment.

Site Preparation and Construction of Site Utilities. Site utility work shall include site electrical, water, hydronic supply and return lines, storm water facilities, and sanitary sewer lines.

Site Preparation and Construction of Remote Switching Unit (RSU). The RSU will be installed in the vicinity of South H Street and Prescott Avenue. The RSU shall be built on an existing telecommunications switching site and will provide for additional telecommunications capacity for the RLSC. Also provide duct bank connection from the new RSU to the existing duct bank network at LC-000105.

Site Preparation and Construction of Temporary and Permanent Cantonment Fencing. Construct Temporary and Permanent Cantonment Fencing in accordance with Site Plans. Construction shall be conducted in coordination with JBLM DES personnel, USACE staff, and the TEMF Contractor to ensure JBLM force protection levels are maintained at all times.

Site Preparation and Construction of Guard Shack Storage Building.

Abate and Demolish Buildings 9504, 9508, 9513. Manage the abatement and demolition of Buildings 9504, 9508, and 9513 in accordance with Appendix CC: Hazardous Material Report (Buildings 9504, 9508, and 9513) and with Appendix EE: Demarcation Matrix.

2.1 GENERAL PURPOSE WAREHOUSE

Provide one GPW. This warehouse is to accommodate logistics, maintenance and administrative operations and to store combustible and non-combustible supplies. Assume 50 percent of personnel are female, unless otherwise indicated.

Maximum number of administrative personnel is 50.

The maximum gross area for the GPW is 62,400 square feet

Minimum interior clear height is 32'-0"

2.1.2 VEHICLE STORAGE YARDS

Provide vehicle storage yards. The vehicle storage yards include, the CECOM SPO yard, Tobyhanna TYAD yard, the TOC training area, Storage yard, LAMS yard, PM SBCT yard, and the TACOM TWV yard. Additionally, provide the connecting roadways from the end of Rainier Drive in the vicinity of the Historic Logistics Gate into the entrance of each yard. Include access road to the Warehouse. Yard and pavement types shall be in accordance with Appendix J- Plans.

2.1.3 RAINIER DRIVE RE-ALIGNMENT

Realign Rainier Drive from the intersection with Tacoma Drive to the vicinity of the Historic Logistics Gate. Road pavement type shall be in accordance with Appendix J- Plans. Provide parallel parking along Rainier Drive.

2.1.4 UTILITIES

Design and construct site utilities. Site electrical and water will require construction of new service lines along the new Rainier Drive realignment prior to demolition of the existing lines. Hydronic supply and return lines shall be installed in the existing groundwater remediation system lines downstream of the existing sparging tower. These lines will provide cool groundwater to both TEMF 1 and TEMF 2 for use in the buildings' hydronic systems. These lines shall be installed from the connection with the sparging tower line to the project demarcation boundary. The Contractor shall also utilize the groundwater for use in a Warehouse water furnace hydronic system as an option item. The Contractor shall develop stormwater management facilities to deal with stormwater generated by the non-TEMF portions of the site in accordance with Appendix J- Plans. The Contractor shall coordinate with the TEMF Contractor for integration of the Warehouse sanitary sewer lines.

2.1.5 REMOTE SWITCHING UNIT (RSU)

Design and construct a Remote Switching Unit building and new telecom duct bank. The contractor shall design and construct a RSU at the existing telecommunication site located at South H Street and Prescott Avenue. The design shall be based on the RSU design provided in Appendix DD- Typical RSU Building Design. Additionally, the contractor shall connect the new RSU to Telecom Manhole LC-000105 on the other side of Prescott Avenue through the construction of a new duct bank. The contractor shall pull copper and fiber optic cable pairs from the new RSU up Prescott Avenue to LC-000020 in accordance with Appendix J- Plans.

2.1.6 TEMPORARY AND PERMANENT CANTONMENT FENCING

Site preparation and construction of temporary and permanent cantonment fencing. The Contractor shall install temporary and permanent cantonment fencing in accordance with Appendix J- Plans. Installation of both the temporary and permanent fences will allow the entire construction area for the Warehouse and TEMF projects to be considered outside the JBLM cantonment area. This will enable both the Warehouse and TEMF contractors to enter the site from I-5 and Murray Road without having to go through screening at the Logistics Center Gate.

2.1.7 GUARD SHACK / STORAGE BUILDING

Design and construct one Guard Shack/ Storage Building. The Contractor shall provide a 1200 square foot building as indicated per Appendix J- Plans and Appendix GG: Guard Shack/Storage Building. This building will be used to provide secure storage for controlled materials as a replacement for buildings 9508 and 9513. This building will need to be supplied with power and communications needed for ICIDs system, as well as potable water and a septic field. The building will also require a fenced perimeter. The Guard Shack/Storage Building will need to be completed and commissioned prior to the start of abatement and demolition of 9508 and 9513 as per Appendix EE- Demarcation Matrix.

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2.1.8 ABATE AND DEMOLISH BUILDINGS 9504, 9508, 9513

Abate and demolish Buildings 9504, 9508, and 9513. The Contractor shall remove Buildings 9504, 9508 and 9513 in accordance with Appendix CC: Hazardous Materials Report. Buildings 9508 and 9513 are in the footprint of the Warehouse. The demolition of these buildings cannot occur prior to the construction and commissioning of the Guard Shack Storage Building as per Appendix EE- Demarcation Matrix.

2.2. SITE:

Provide all site improvements necessary to support the new building facilities. Refer to Paragraph 6.

Approximate area available 30.00 acres

2.3. GOVERNMENT-FURNISHED GOVERNMENT-INSTALLED EQUIPMENT (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCRs/TVs, all utility connections and space with required clearances for all GFGI items. Fire extinguishers are GF/GI personal property, while fire extinguisher brackets and cabinets are Contractor furnished and installed CF/CI. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: Tables, Chairs, Refrigerators, Microwave Ovens

2.4. FURNITURE REQUIREMENTS

Provide furniture design for all spaces listed in Chapter 3 and including any existing furniture and equipment to be re-used. Coordinate with the user to define requirements for furniture systems, movable furniture, storage systems, equipment, any existing items to be reused, etc. Early coordination of furniture design is required for a complete and usable facility.

The procurement and installation of furniture is NOT included in this contract. Furniture will be provided and installed under a separate furniture vendor/installer contract. The general contractor shall accommodate that effort with allowance for entry of the furniture vendor/installer onto this project site at the appropriate time to permit completion of the furniture installation for a complete and usable facility to coincide with the Beneficial Occupancy Date (BOD) of this project. The furniture vendor/installer contract will include all electrical pre-wiring and the whips for final connection to the building electrical systems however; the general contractor shall make the final connections to the building electrical systems under this contract. Furthermore, the general contractor shall provide all Information/Technology (IT) wiring (i.e. LAN, phone, etc.) up to and including the face plate of all freestanding and/or systems furniture desk tops as applicable, the services to install the cable and face plates in the furniture, the coordination with the furniture vendor/installer to accomplish the installation at the appropriate time, and all the final IT connections to the building systems under this contract.

The Government reserves the right to change the method for procurement of and installation of furniture to Contractor Furnished/Contractor Installed (CF/CI). CF/CI furniture will require competitive open market procurement by the Contractor using the Furniture, Fixtures and Equipment (FF&E) package. Reference applicable appendix for Preliminary FF&E Information including furniture dimensions sizes as shown in the Standard Design.

2.5. NOT USED

3.0 GENERAL PURPOSE WAREHOUSE

3.1 General

The General Purpose Warehouse is comprised of logistics and/or administration areas, open storage areas, small assembly, and shipping/receiving operations.

3.2 Functional and Area Requirements

Gross building area shall be calculated in accordance with Appendix Q. Net area is measured to the inside face of the room or space walls. Minimum dimension where stated shall be measured to the inside face of the defining enclosure. Net area requirements for programmed spaces are included in this paragraph. If net area requirements are not specified, the space shall be sized to accommodate the required function and to comply with code requirements, overall gross area limitations, and any other requirement of this RFP. Area requirements for corridors, stairs, mechanical, and electrical rooms will typically be left to the discretion of the Offeror.

3.2.1 Accessibility Requirements

The General Purpose Warehouse shall comply with Architectural Barriers Act (ABA) for Buildings and Facilities.

3.2.1.1 Site Plan Design and Construction:

- (a) Provide accessible access from the parking lot to the building.
- (b) Contractor shall follow the Demarcation Matrix in Appendix EE for clarification on areas of responsibility for site work to be performed.

3.2.1.2 Facility Design and Construction:

- (a) Construction Materials - The building must be constructed with non-combustible materials and building elements, including walls, columns and floors.
- (b) Flooring – In warehouse bays, all floors shall be sealed and hardened during the curing process.
- (c) Intrusion Detection – The building will be protected by an intrusion detection system (ICIDS) tied into the installation's central monitoring system.
- (d) Penetrations in the walls must not reduce the specified fire resistance ratings. The fire resistance ratings of structural elements and construction assemblies must be in accordance with American Society of Testing and Materials E 119-98, Standard Test Methods for Fire Tests of Building Construction and Materials.
- (e) If fire barrier walls are erected with expansion joints, the joints must be protected to their full height.
- (f) Mechanical, Electrical, and Telecommunications Rooms: Rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. Filter changes and preventative maintenance shall be performed without requiring access to the facility. All telecommunications rooms shall be conditioned space. Telecommunications room will be provided in accordance with the latest Installation Information Infrastructure Architecture (I3A) Technical Criteria. Telecommunications room provides a demarcation point between the outside plant cable and the building telecommunications cabling. Refer to paragraphs 3.7 ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS for additional information.

3.2.2 General Purpose Warehouse (GPW): 62,400 sf

3.2.2.1. Warehouse Area Functional Space Requirements:

(a) Forklift Recharge Area: Provide a main (centralized) recharge area for all Warehouse spaces, For the purpose of recharging (6) battery operated forklift with a capacity of (4,500) lbs each. Conventional and standup electrical lifts will be used. See Mechanical and Electrical requirements.

(b) Toilet Room – (1) Unisex toilet room to be provided at loading dock area. – Toilet shall be centralized and shared between all Warehouse areas. Walls extend to structural deck above. Ceilings will be moisture-resistant pointed-and-taped gypsum board. Restroom shall be ABA compliant (includes required grab bars, mounting heights of fixtures, etc.).

(c) Circulation is not tabulated in space allocation table. Provide circulation space as needed.

(d) Roll-Up Doors - Provide (10) 10'W x 12'H vertical roll up doors. Provide (1) door for TACOM and Forklift Recharge area for access to the Dock. Provide (2) doors each for PM-SBCT, TYAD, CECOM (FBCB2), and CECOM (TRCS) – one door for access to the dock and another door at the opposite side of each warehouse on grade for forklift access (with minor ramp if applicable).

(e) Provide metal eyebrow canopy(s) to protect forklift drivers and pedestrians from the elements during inclement weather. Canopy to extend out above each pedestrian door, vertical (non-dock side) roll-up doors provided for forklift access.

(f) Pedestrian Doors at Docks – Provide (10) pedestrian doors, one each per roll up door,

(g) Weather Seals On Doors - Provide nylon brush-style weather stripping on all perimeter doors of the facility, including the overhead vertical roll-up doors, for heating energy conservation and for pest management control.

(h) TACOM Warehouse area: Provide a minimum of 240 linear ft. of Industrial Pallet shelving to accommodate a minimum of 50 pallet positions.

(i) PM-SBCT Warehouse area: Provide (4) rows of Industrial Pallet shelving to accommodate a minimum of 165 pallet positions.

(j) CECOM (TRCS) Warehouse area: Provide Industrial Pallet shelving. Shelving shall accommodate a minimum of 500 pallet positions.

(k) CECOM (FBCB2) Warehouse area: Provide a pallet breakdown area immediately after the dock door area. 30% of the warehouse area shall be dedicated to Bench Stock. 70% of the warehouse area shall be dedicated to storage with Industrial Pallet shelving to accommodate a minimum of 165 pallet positions. The two areas shall be separated by full height chain link fence.

(l) TYAD Warehouse area: Provide (2) rows of Industrial Pallet shelving. Provide space for a Vertical Rack Storage system. Provide a 10' x 10' workstation adjacent to the dock door.

(m) Vending Area-Provide area approx. 150 sq. ft

(n) Provide a full height chain link fence between each adjacent warehouse area from the finished floor to the underside of the structure.

(o) Fork Truck Aisle: Provide 11 feet minimum width corridors.

(p) Pallet Rack Storage area: Provide an area for storage of goods on pallet racks in each warehouse. The Pallet Rack Storage System is a CFCI item. Coordinate with Government to provide suitable space, lighting and structural support for the system and to define detailed requirements. Provide the detailed design layout necessary to install a complete Pallet Rack System that utilizes industry standard components and dimensions. Provide a minimum of 900 pallet spaces (including floor and top shelf locations). Assume that a 4,500 pound capacity,

electric, standup, reach-type lift truck will be used to place and retrieve pallets. Stack pallets six (6) high so that the rack system takes full advantage of the clear height specified in paragraph 2.1 for the warehouse area. System design shall be based on 48" wide X 40" deep X 48" high pallets weighing no more than 2,500 pounds each. Where possible, use a standard 9'-3" module (108" open) shelf length. Provide at least two heavy-duty (non-waterfall type) pallet supports per pallet space plus wire shelf decking. Provide sufficient rack depth for pallets so that they may be placed flush with the aisle beam face without overhanging off the rear. Install top shelves below the top of 26' high standard width uprights so that pallets at the end of a row will not accidentally slip off the side. Pallet rack system design shall include a 4-inch (minimum) clear space between adjacent pallets and a 4-inch (minimum) clear space between the top of each pallet and the bottom of the shelf beam above it. Pallet rack system design shall be such that the top of the load on the top shelves shall be a minimum of 6" below the clear unobstructed height required in the warehouse. Assume that a fork lift with a 320" mast will be used to place and retrieve pallets. Provide floor mounted metal corner guards extending from the floor to the first storage level to protect the storage racks' outside corners in high traffic areas such as corridors.

(q) Truck Dock Areas:

1. Docks shall be 48" (nominal) above hardstand. Provide dock seals, bumpers and bollards.
2. Dock Levelers/Truck Locks: Provide low-maintenance, ergonomically-friendly, full-pit combination dock levelers and truck locks with indoor and outdoor indicator lights at each of the truck dock doors. Dock height above the hardstand shall be 48". Truck/trailer heights may vary from 36" above the hardstand up to 60" above the hardstand. Provide dock levelers to accommodate this range using lifts which are electrically operated. Dock levelers need to be of sufficient width for safe and efficient fork lift operation and have features intended to prevent lifts from driving off the dock when a trailer is not present. When at rest and in the level position, the levelers shall be supported by steel posts rather than totally dependent on hydraulics. Levelers shall have a rated capacity of 30,000 pounds or more.
3. Dock Wells: Each dock well shall be designed to service a 53-foot long trailer plus tractor. Floors shall be reinforced concrete with a concrete sealed surface and level. Floor loading shall be adequate for maximum allowable truck/trailer loads. Dependable drainage shall be provided.
4. Dock/Truck Guards - To avoid damage to the door jambs from trucking operations, suitable protective posts (bollards) or concrete truck wheel guards shall be provided at all truck entrances.
5. Dock Bumpers - Rubber bumpers, size 12"d x 24"w x 12"h, are to be installed on both sides of each truck bay per manufacturer's specifications.
6. Loading Dock – Provide Covered Loading Dock.

3.2.2.2 Administrative Area Functional Space Requirements: First Floor 689 sf

(a) Stairwell - Stair treads and risers to be rubber, with painted steel handrails. Underside of stairs to be exposed, painted. Partitions extend to deck above, and ceiling is exposed. Handrail shall be a metallic, low maintenance type material. One stairwell to serve and provide access to top of Administrative deck and roof of building.

(b) Passenger Elevator - Hydraulic passenger elevator with adjacent equipment room. Provide a State of Washington certified inspector (State licensed elevator inspector and/or State labor and industries inspector) to inspect the installation, test all new elevators, applicable to project, and certify in writing that they meet all requirements.

(c) Vestibule/Lobby-Main Entry: including Admin Space - Provide an enclosed transition space between the exterior and lobby. Provide a minimum of 7' clearance between doors. Area consists of integral walk off mat, VCT flooring, GWB walls, and 24" x 24" acoustical ceiling grid and tile (9'-0" AFF) with area for desk, chair and file cabinet.

(d) Electrical Closet – Flooring shall be sealed concrete. Walls to be GWB at 9'-0" AFF.

(e) Mechanical Closet – Flooring shall be sealed concrete. Walls to be GWB at 9'-0" AFF.

(f) Miscellaneous Storage Area – Provide (3) fenced walled, secured areas for temporary storage, located below the Second Floor Admin. Provide (1) Man door and (1) Rollup Door per storage area accessible from the exterior. Flooring shall be sealed concrete. Interior walls between storage areas are to be chain fence and extend to underside of second floor admin.

3.2.2.3 Administrative Area Functional Space Requirements: Second Floor 6014 sf

(a) Open Office Area - Consisting of GWB walls, and 24" x 24" acoustical ceiling grid and tile (9'-0" AFF). Provide a Copier/scanning station in the Area located along an interior circulation path. Area includes the following GFGI furniture:

1. (15) 8' x 6' Cubicle Offices consisting of: (1) 8' Work surface, (1) 4' Work surface, (1) mobile three drawer pedestal, overhead cabinet with task light, (1) two drawer lateral file.
2. (24) 6' x 6' Open Office workstations consisting of: (1) 6' work surface, (1) 4' work surface L-Shaped layout, (1) mobile three drawer pedestal and (1) pedestal fixed with 2 file drawers.

(b) Break Room - Contractor shall provide 10 linear feet of base cabinets 24" deep, 34" high, with an integral 4" high back-splash. The matching wall-mounted cabinets shall also be provided by the Contractor. Except for the ABA cut-out under the sink, base cabinets shall include one drawer and one internal adjustable shelf with door. Contractor to provide (2) sinks. Contractor to provide a fabric bulletin board 3' x 4'. Provide adequate space above the counter to accommodate (2) GFGI microwave ovens. Size the area to accommodate the following GFGI items: (2) refrigerators, (2) 36" sq. tables and (8) chairs. A vending area shall be provided in the Common Break Room. Size vending area to accommodate (2) full size GFGI vending machines. Provide power outlets for the microwave ovens, vending machines and refrigerators.

(c) Toilet Rooms ((1) Men, (1) Women) - Walls extend to structural deck above. Ceilings will be moisture-resistant pointed-and-taped gypsum board. Built-in lavatory counter will have a solid surface (non-laminate) finish. Each toilet room will have sufficient water closets and urinals (in Men's Room) enclosed with floor mounted, overhead braced partitions. Each room to include the following items (mounted per ABA): mirror, soap dispenser for each lavatory, paper towel dispenser / trash receptacle, and toilet paper dispenser for each water closet. At least one of

each fixture type per restroom to be ABA compliant (includes required grab bars, mounting heights of fixtures, etc.).

(d) Corridor - Area consists of GWB walls, and 24" x 24" acoustical ceiling grid and tile (9'-0" AFF).

(e) Conference Room - Room consists of GWB walls, and 24" x 24" acoustical ceiling grid and tile (9'-0" AFF). Contractor shall provide dry-erase white board, manual pull-down screen and electrical connections for an overhead projector. Room includes GFGI (2) conference tables and (12) chairs with ability to split into (2) separate rooms (partition wall/room divider).

(f) Telecommunication Rooms - Contractor shall provide and install 50sf of finish-grade interior, fire treated, 3/4" A/C grade plywood wall panel to serve as a termination board; the plywood shall be finish painted.

(g) Janitor Closet (1) - Flooring shall be sealed concrete. Walls GWB to 9'-0" AFF. Janitor closet shall have a 10" deep floor mounted stainless steel mop sink, 18" perimeter stainless steel backsplash ceramic tile, hot and cold service faucet, a four holder mop rack, and two 18" deep by 48" long heavy duty stainless steel shelves for storage of cleaning supplies. Janitor closet shall have space for storage of buckets and vacuum.

3.2.2.4 GPW: Space Allocation Table

MINIMUM SQUARE FOOTAGE	
SPACE	NSF
PRIMARY SPACES:	
PM-SBCT - Warehouse	18500
TYAD - Warehouse	7850
TACOM - Warehouse	240
CECOM (FBCB2) – Warehouse	8220
CECOM (TRCS) - Warehouse	13500
ADMINISTRATIVE FUNCTION - First Floor	689
ADMINISTRATIVE FUNCTION - Second Floor	6014
Miscellaneous Storage Areas	3000
SECONDARY SPACES:	
TOILET (MENS)	200
TOILET (WOMENS)	200
TOILET (UNISEX) - Warehouse	as required
STAIRWELL- First /Second Floor	as required
PASSENGER ELEVATOR -	as required
VESTIBULES	as required
CORRIDORS	as required
CONFERENCE ROOM	350
JANITOR CLOSET	2 @ 15 sf ea.
ELECTRICAL ROOM	as required
TELECOMMUNICATIONS ROOM	as required per I3A
BREAK ROOM	250
FORKLIFT RECHARGING AREA - Warehouse	6 @ 100 sf ea. Approx 2150
MECHANICAL ROOM	as required
RECEPTION AREA	as required
VENDING AREA	150

3.2.3. Remote Switching Unit (RSU) Functional Requirements:

Provide a RSU. A typical RSU Building Design is provided in Appendix DD for reference.

3.2.4. Guard Shack Storage Building Functional Requirements:

(a) Building Size: Provide 40-ft x 30-ft single-story, slab-on-grade, slightly elevated Building.

(b) Building Plan: See Appendix GG: Guard Shack/Storage Building Floor Plan.

(c) Fencing: Provide a 10-ft high razor wire topped fenced perimeter 25-ft from the building exterior. Include a double leaf vehicle gate.

(d) Building Utilities: Provide electricity and telecommunications service to the Building to allow for lighting, heat, and connection to the IDS. Provide potable water in order to provide hot and cold water in the hand wash basin and shower. Provide on-site septic drain field with clean-out for the disposal of water from the hand basin, shower, and building interior drains.

(e) Intrusion Detection System (IDS): Building requires the installation of an IDS. The system will be GFCI. The IDS control panel will be placed in the Dry Storage Room.

(f) Building Conditioning: Building will require heat and passive ventilation. Passive ventilation using static wall vent (high and low) is needed to allow for the ventilation of all elevations within the Building.

(g) Building will utilize a single key for all locks. No additional copies of this key will be made.

(h) Building Lighting: All interior light fixtures will need to be explosion proof. Provide exterior lights at all doors.

(i) Electrical: Provide a 110V duplex explosion-proof outlet on each wall of each room. Place the electrical panel in the Dry Storage Room.

(j) Plumbing: Provide hand wash basin with hot and cold water. Provide shower basin with fixtures for hot and cold water. Provide floor drains in Storage Room 1, Storage Room 2, and the Shower Room. All plumbing will drain to an onsite septic drain field which is located within the 25-ft perimeter fence.

(k) Interior Finishes: Provide sealed concrete floors. Walls will be painted with a non-porous rubber based paint to allow for ease of cleaning. Ceiling will be painted with a non-porous rubber based paint to allow for ease of cleaning.

(l) Doors: Provide heavy duty doors for all exterior entrances.

(m) Site: Provide concrete sidewalk 6-ft wide from the double exterior doors to the enclosure vehicle gate.

3.3 SITE REQUIREMENTS

3.3.1 Walks

(a) Provide pedestrian walks within the designated construction area and connect to existing sidewalks, where applicable.

(b) Sidewalks shall be a minimum of 6 feet wide. Pedestrian sidewalks shall be constructed of Portland Cement Concrete having a minimum nominal thickness of 4 inches. Design joint patterns uniformly, symmetrical, and in accordance with American Association of State Highway and Transportation Officials (AASHTO) standards. The length to width ratio shall not exceed 1.25 for non-reinforced pavements.

3.3.2 Site Structures and Amenities

Dumpster Area: Dumpster enclosure area(s) and screening shall be located, designed and constructed by the Contractor. The Contractor is responsible for locating the dumpster areas in accordance with UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings. The GFGI dumpsters shall be located outside of restricted areas to allow for servicing activities. Dumpster pads shall be sized to accommodate both trash and recycling dumpsters. Dumpster screening shall be aesthetically and architecturally compatible with the building it serves and shall be designed in accordance with the Installation's requirements.

3.3.3 Site Functional Requirements

(a) Service Drives: The Contractor shall provide service drives to each building. The drives shall be located in accordance with UFC 4-010-01. Where applicable, access to the drives shall be restricted as required by UFC 4-010-01. The pavement design shall be as required by paragraph 5.2.3 VEHICLE PAVEMENTS. The minimum access drive width shall be 10 feet. Provide curb and gutter only where needed for drainage. Minimum turning radius shall be designed as required for emergency vehicle access.

(b) Fire Access Lanes: The Contractor shall provide fire access lanes in accordance with UFC 3-600-01, UFC 4-010-01, NFPA 1 and the Installation's requirements.

3.4 ARCHITECTURAL REQUIREMENTS

3.4.1 Hardware

3.4.1.1 Finish Hardware: All hardware shall be consistent and shall conform to ANSI/BMHA standards for Grade 1. All requirements for hardware keying shall be coordinated with the Contracting Officer. Extension of the existing Installation keying system shall be provided. The Installation's keying system is Best Access Systems B.A.S.I.S. G. Cores shall have not less than seven pins; cylinders shall have key-removable type cores. Disassembly of knob or lockset shall not be required to remove core from lockset. Locksets for mechanical, electrical and communications rooms only shall be keyed to the existing Installation Master Keying System. HVAC terminal units that are accessed from a central corridor shall have a deadbolt to minimize protrusion into corridor. Plastic cores are unacceptable. Provide closers for all exterior doors, all doors opening to corridors and as required by codes. Exit devices shall be installed all building egress doors.

3.4.1.2 All hardware must be security type and heavy duty for maximum wear resistance and must comply with all Architectural Barriers Act (ABA) requirements.

3.4.1.3 Auxiliary Hardware: Provide wall or floor stops for all exterior doors that do not have overhead holder/stops. Provide other hardware as necessary for a complete installation.

3.4.1.4 Fire Door Hardware: Hardware for fire doors shall be installed in accordance with the requirements of applicable codes. Exit devices installed on fire doors shall have a visible label bearing the marking "Fire Exit Hardware". Other hardware installed on fire doors, such as locksets, closers, and hinges shall have a visible label or stamp indicating that the hardware items have been approved by an approved testing agency for installation on fire-rated doors. Hardware for smoke-control door assemblies shall be installed in accordance with applicable codes.

3.4.1.5 Additional Pedestrian Doors -(1) at Unisex restroom, (1) at vending and (1) additional egress in PM-SBCT, (1) at electrical room, (1) at Mechanical and (1) Pair Storefront Doors at Main Entry.

3.4.2 Special Acoustical Requirements

3.4.2.1 Exterior walls and roof/floor/ceiling assemblies, doors, windows and interior partitions shall be designed to provide for attenuation of external noise sources such as airfields in accordance with applicable criteria, but no less than the following:

- (a) Interior partitions – STC 45
- (b) Exterior walls – STC 42
- (c) Doors and frames – STC 25

3.4.2.2 Due to the operation of mechanical and electrical systems and devices, sound conditions and levels for interior spaces shall not exceed levels as recommended by ASHRAE handbook criteria. Provide acoustical treatment for drain lines and other utilities to prevent noise transmission into the offices and other areas requiring noise suppression.

3.4.3 EXTERIOR DESIGN OBJECTIVES

3.4.3.1 Provide durable and easily maintainable materials. Do not use exterior materials that require periodic repainting or similar refinishing processes. Material exposed to weather shall be factory pre-finished, integrally colored or provided with intrinsic weathering finish. Do not use pollutant generating finishes.

3.4.3.2 Exterior Walls: Where Exterior Insulation and Finish Systems (EIFS), or any other material except CMU or other Masonry material is used as exterior finish material, it shall be in conjunction with a CMU wainscot. EIFS shall be "high-impact" type and shall be "drainable" type. Masonry units shall be tested for efflorescence. Efflorescence testing shall conform to the provisions of ASTM C 67. CMU construction shall comply with the provisions of ASTM C 1400.

3.4.3.3 Roof: Minimum roof slope for membrane roof systems shall be 2" inches per foot. Minimum roof slope for pitched roof systems shall be as recommended by roof system manufacturer. Membrane roof systems shall be fully adhered. Structural standing seam metal roofs shall comply with the requirements of ASTM E 1592. Roof system shall be Underwriters Laboratory (UL 580 Class 90) rated or Factory Mutual Global (FM) I-90 rated. Roof system shall comply with applicable criteria for fire rating. Roof drainage shall be separated from paved areas and/or storm water collection systems. Roof surface shall not be pollution generating.

(a) Roof Mounted Equipment: Roof mounted equipment shall not be used unless absolutely necessary. If roof mounted equipment is required: provide permanent access walkways and platforms to protect roof. Roof mounted equipment on membrane roof systems shall be screened by the roof parapet.

(b) Roof access from building exterior is prohibited.

(c) Roof Access - At least one interior means of access to the roof and top of administrative space is required.

(d) Personal fall arrest systems shall be required for workers servicing roof-mounted equipment. All necessary anchorages for attachment of personal fall arrest equipment shall be provided in accordance with applicable codes, criteria, and shall utilize boots.

3.4.3.4 Trim and Flashing: Gutters, downspouts, and fascias shall be factory pre-finished metal and shall comply with SMACNA Architectural Sheet Metal Manual.

3.4.3.5 Bird Habitat Mitigation: The Contractor shall provide details in the design necessary to eliminate the congregating and nesting of birds at, on, and in the facility.

3.4.3.6 Exterior Doors and Frames:

(a) Main Entrance Doors: Provide aluminum storefront doors and frames with Architectural Class 1 anodized finish, fully glazed, with medium or wide stile for entry into lobbies or corridors. Provide doors complete with frames, framing members, sub frames, transoms, sidelights, trim, applied mountings, and accessories. Framing systems shall have thermal-break design. Storefront systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria.

(b) Other Exterior Doors: Provide insulated hollow metal exterior doors for entry to all spaces other than corridors, lobbies, or reception/waiting rooms. Doors and frames shall comply with applicable codes and criteria. Doors shall be minimum Level 3, physical performance Level A, Model 2 flush. Frames shall be 12-gauge, with continuously welded mitered corners and seamless face joints. Doors and frames shall be A60 galvanized, shall comply with ASTM A653 and shall be factory primed. Fire-rated openings shall comply with applicable codes, and the requirements of the labeling authority. Door and frame installation shall comply with applicable codes and criteria.

(c) Electrically Operated Sectional Overhead Roll-up Doors: Doors shall be industrial class, high-

lift sectional overhead doors, electrically operated, with auxiliary hand chain override. In the open position, the horizontal portion of the door shall be aligned with the angle of the roof structural elements; and shall be no more than 6 inches below the bottom of the roof structural elements. Doors shall consist of horizontal sections hinged together which operate in a system of tracks to completely close the door opening in the closed position and make the full width and height of the door opening available for use in the open position. Provide a door locking mechanism on the interior. Provide a permanent label on the door indicating the name and address of the manufacturer. Doors, components, and methods of installation shall be designed in accordance with DASMA 102. Minimum design wind load shall be 20 psf. Maximum wind load deflection of the door shall not exceed the door height in inches divided by 120 and the door width in inches divided by 120. Doors shall be operable during design wind load when tested in accordance with ASTM E 330. Door sections shall be formed from hot-dipped galvanized steel not lighter than 16 gauge with longitudinal integral reinforcing ribs. Meeting rails shall have interlocking joints to ensure a weather tight closure and alignment for full width of the door. Provide sections of the height indicated or the manufacturer's standard. Do not exceed 24 inch height for intermediate sections. Bottom sections may be varied to suit door height. Do not exceed 30 inch height for bottom section. Door sections shall be insulated and shall provide a "U" factor of 0.14 or less when tested in accordance with ASTM C 1363.

Interior of door sections shall be covered with steel sheets of not lighter than 20 gauge to completely enclose the insulating material. Provide galvanized steel tracks not lighter than 10 gauge. Provide vertical tracks with continuous steel angle not lighter than 10 gauge for installation to walls. Incline vertical track through use of adjustable brackets to obtain a weather tight closure at jambs. Reinforce horizontal track with galvanized steel angle; support from track ceiling construction with galvanized steel angle and cross bracing to provide a rigid installation. Provide hinges, brackets, rollers, locking devices, and other hardware required for complete installation.

Counterbalance doors with an oil-tempered, helical-wound torsion spring mounted on a steel shaft. Provide adjustable spring tension; connect spring to doors with cable through cable drums. Provide cable safety factor of at least 7 to 1. Provide operators of the type recommended by the door manufacturer. Operators shall include electric motor, machine-cut reduction gears, steel chain and sprockets, magnetic brake, brackets, pushbutton controls, limit switches, magnetic reversing contactor, a manual operator as specified below for emergency use and other accessories necessary for operation. The electric operator shall be designed so that the motor may be removed without disturbing the limit switch timing and without affecting the manual operator. The manual operator shall be clutch controlled so that it may be engaged and disengaged from the floor; operation shall not affect limit switch timing. Provide an electrical or mechanical device that disconnects the motor from the operating mechanism when the manual operator is engaged. Provide a galvanized, endless chain operating over a sprocket. Extend chain to within 4 feet of the floor and mount on inside of building. Obtain reduction by use of roller chain and sprocket drive or gearing. Provide chain cleat and pin for securing operator chain. The force required to operate the door shall not exceed 35 pounds.

Each door motor shall have an enclosed, across-the-line type, magnetic reversing contactor, thermal overload and under voltage protection, solenoid-operated brake, limit switches, and control switches. Locate control switches at least 5 feet above the floor so the operator will have complete visibility of the door at all times. Control equipment shall conform to NEMA ICS 1 and NEMA ICS 2. Control enclosures shall be NEMA ICS 6, Type 12 or Type 4, except that contactor enclosures may be Type 1. Each control switch station shall be of the three-button type; buttons shall be marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" buttons shall require only momentary pressure to operate. The "CLOSE" button shall require constant pressure to maintain the closing motion of the door. If the door is in motion and the "STOP" button is pressed or the "CLOSE" button released, the door shall stop instantly and remain in the stop position; from the stop position, the door may be operated in either direction by the "OPEN" or "CLOSE" buttons. Pushbuttons shall be full-guarded to prevent accidental operation. Provide limit switches to automatically stop doors at the fully open and closed positions. Limit switch positions shall be readily adjustable. Limit switches shall be mounted/protected in such a manner to minimize external damage/accidents. Provide a safety device on the bottom edge of electrically operated doors. The device shall immediately stop and reverse the door in its closing travel upon contact with an obstruction in the door opening or upon failure of the device or any component of the control system and cause the door to return to the full open position. The door-closing circuit

shall be automatically locked out and the door shall be operable manually until the failure or damage has been corrected. Do not use the safety device as a limit switch.

Each sectional overhead door shall be furnished with a "headache bar" on the interior and exterior side of the facility. Set bottom of each "headache bar" 6-inches below bottom of door head height and 4-feet from face of door. Each interior "headache bar" shall be suspended from a pair of steel cables mounted on the roof structure. Each exterior "headache bar" shall be suspended from a pair of steel cables mounted on the roof structure or suspended from a pair of steel cables mounted on the upper arm of a structural steel tube "I" structure set in concrete on one side of the door. Use one structural steel tube "I" structure on each side of doors wider than 10-feet. Length of "headache bar" shall be minimum 80% the width of the door and shall be centered on the door width.

3.4.3.7 Exterior Windows: Provide insulated, high efficiency window systems, with thermally broken frames complying with applicable codes and criteria. Operable windows shall be furnished with locks, and fiberglass or aluminum insect screens removable from the inside. Curtain wall systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria. The exterior window sill shall be designed to discourage bird nesting. Window sill interior shall receive a Corian-type solid surface.

3.4.3.8 Exterior Glass and Glazing: Material and installation shall comply with applicable codes and criteria.

3.4.3.9 Thermal Insulation: Provide exterior wall, floor, and roof/ceiling assemblies with thermal transmittance (U-values) required to comply with the proposed energy calculations for the facilities. Insulation shall not be installed directly on top of suspended acoustical panel ceiling systems.

3.4.3.10 Exterior Louvers: Exterior louvers shall have bird screens, security screens to prevent illegal entry and shall be designed to exclude wind-driven rain. Exterior louvers shall be made to withstand wind loads in accordance with the applicable codes. Wall louvers shall bear the Air Movement & Control Association (AMCA) International certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D and AMCA 511. Louver finish shall be factory applied.

3.4.3.11 Provide Clerestory Windows for Day lighting

3.4.4 INTERIOR DESIGN OBJECTIVES

3.4.4.1 General: Maximize the use of day lighting. Provide sustainable materials, finishes, and furnishings that require minimal or no maintenance and are easily replaced. Provide interior surfaces that are easy to clean, light in color, and capable of resisting scuffs and soiling normally associated with a light industrial/commercial type building. Interior spaces should be structured to allow maximum flexibility for future modifications.

3.4.4.2 Signage: Provide interior signage as required by applicable codes and criteria.

3.4.4.3 Bulletin Boards: Provide one bulletin board at each entry vestibule. Bulletin board shall be 4'-0" high and 6'-0" wide. Bulletin boards shall have a header panel and shall have lockable, glazed doors.

3.4.4.4 Corner Guards: Provide surface mounted, high impact resistant, integral color, corner guards, extending from floor to ceiling for wall and column outside corners in high traffic areas such as corridors, waiting areas, lobbies, conference and multi-purpose rooms. Factory fabricated end closure caps shall be furnished for top and bottom of surface mounted corner guards.

3.4.4.5 Chair Rail: Chair rails shall be installed in areas prone to hi-impact use such as corridors, waiting areas, conference rooms and break areas.

3.4.4.6 Guardrails. Guardrails shall protect all exterior walls with minimum 17" high single guard

rails and all interior walls with minimum 44" high double guard rails adjacent to the defined warehouse storage area.

3.4.4.7 Casework: Provide cabinets complying with AWI Quality Standards. Countertops shall have waterfall front edge. Toilet countertops and all other countertops with sinks shall have integral coved backsplash. Toilet countertops shall be minimum ½-inch thick cast 100 percent acrylic polymer solid surfacing material with waterfall front edge and integral coved backsplash.

3.4.4.8 Fire Extinguisher Cabinets and Mounting Brackets: Furnish and install semi - recessed fire extinguisher cabinets and mounting brackets as required by applicable codes and criteria. Furnish a list of installed fire extinguisher cabinets and mounting brackets (including location, type and size) to the Contracting Officer's Representative.

3.4.4.9 Furnish and install a 3200 series Knox box on all buildings with recessed hinge lid adjacent to the building entrance.

3.4.4.10 Interior Doors and Frames:

(a) Wood Doors: Provide flush solid core wood doors with Grade A hardwood face veneer for transparent finish. Stile edges shall be non-finger jointed hardwood compatible with face veneer. Provide wood doors at all interior locations except noted otherwise. Provide window panel on all wooden doors exiting into a corridor.

(b) Insulated Hollow Metal Doors: Comply with applicable codes and criteria. Doors shall be minimum Level 3, Physical Performance Level A, Model 2; factory primed. Provide insulated hollow metal doors at mechanical, electrical and telecommunications rooms, toilets, janitor closets, storage rooms, and high traffic areas.

(c) Hollow Metal Frames: Comply with ANSI A250.8/SDI 100. Frames shall be minimum Level 3, 16 gauge, with continuously welded mitered corners and seamless face joints; factory primed. All door frames shall be hollow metal frames reinforced at lock assemblies.

(d) Fire-rated and Smoke Control Doors and Frames: Comply with applicable codes, criteria and requirements of labeling authority.

(e) STC ratings shall be of the sound classification required and shall include the entire door and frame assembly.

3.4.4.11 Window Treatment: Provide horizontal mini blinds at all exterior windows. Uniformity of window covering color and material shall be maintained to the maximum extent possible throughout each building. Window stools shall be minimum ½ inch thick cast 100 percent acrylic polymer solid surfacing material. Uniformity of window covering color and material shall be maintained throughout the building.

3.4.4.12 Mold Mitigation: The Designer of Record shall provide details in the design analysis and design showing steps taken to mitigate the potential growth of mold and mildew in the facility.

3.4.4.13 Drinking Fountains- Provide the following drinking fountains: (2) high/low fixtures in the Admin areas- (1) per floor and (3) high/low fixtures in the Warehouse areas.

3.4.4.14 Toilet Accessories: Furnish and install the items listed below and all other toilet accessories necessary for a complete and usable facility. All toilet accessories shall be Type 304 stainless steel with satin finish. Toilet accessories shall include the following:

(a) Glass Mirror/Shelf – 18 inch by 24 inch glass mirror on stainless steel frame with shelf at each lavatory

(b) Hands free liquid soap dispenser at each lavatory

(c) Hands free paper towel dispenser

- (d) Waste receptacle- recess mounted at each lavatory/toilet area
- (e) Sanitary napkin disposal at each female toilet
- (f) Toilet paper dispenser – lockable multiple roll toilet paper dispenser at each toilet
- (g) Sanitary toilet seat cover dispenser – at each toilet stall
- (h) Grab bars – as required by ABA

3.4.5 Finishes

Designers are not limited to the minimum finishes listed in this paragraph and are encouraged to offer higher quality finishes. A minimum of 1% surplus or additional flooring tile (for each type used) shall be provided by the Contractor for replacement/repair purposes.

3.4.5.1 Minimum Paint Finish Requirements

(a) All paints used shall be listed on the "Approved Product List" of the Master Painters Institute (MPI). Application criteria shall be as recommended by MPI guide specifications for the substrate to be painted and the environmental conditions existing at the project site.

(b) Exterior surfaces, except factory pre-finished material or exterior surfaces receiving other finishes shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Exterior paints and coating products shall be classified as containing low volatile organic compounds (VOCs) in accordance with MPI criteria. Application criteria shall be as recommended by MPI guide specifications. Provide an MPI Gloss Level 5 Finish (semi-gloss), unless otherwise specified.

(c) Interior surfaces, except factory pre-finished material or interior surfaces receiving other finishes, shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Interior paints and coating products shall contain a maximum level of 150 grams per liter (g/l) of VOCs for non-flat coatings and 50 g/l of VOCs for flat coatings. Provide an MPI Gloss Level 5 Finish (semi-gloss) in wet areas and a flat finish in all other areas.

3.4.5.2 Minimum Interior Finish Requirements

(a) Wall, ceiling, floor finishes and movable partitions shall conform to the requirements of the IBC, NFPA and UFC 3-600-01 Fire Protection Engineering for Facilities. Where code requirements conflict, the most stringent code requirement shall apply.

(b) Carpet shall be minimum of 2 yarn ply, modular tile conforming to ISO 2551, ASTM D 418, ASTM D 5793, ASTM D 5848, solution dyed, tufted, cut and loop pile, commercial 100% branded (federally registered trademark) nylon continuous filament. Vinyl composition tile (VCT) shall be minimum 1/8 inch thick, conforming to ASTM F 1066, Class 2, through pattern tile, Composition 1, asbestos free, with color and pattern uniformly distributed throughout the thickness of the tile.

(d) Walls: All gypsum board shall achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. All gypsum board shall be transported, handled, stored and installed in accordance with the GYPSUM ASSOCIATION – Guidelines For Prevention Of Mold Growth On Gypsum Board (GA-238-03). Use impact resistant gypsum board in corridors, storage rooms, stairwells and conference rooms. All wall finish shall be minimum 5/8" painted gypsum board, except where stated otherwise. Gypsum wall board shall not be used as a wall finish in the warehouse area below 8 feet above finish floor. The warehouse side of all gypsum wall board partitions shall have a minimum 20 gauge sheet metal finish up to a height of

8 feet above the finish floor.

(e) Ceiling: All gypsum board shall achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. All gypsum board shall be transported, handled, stored and installed in accordance with the GYPSUM ASSOCIATION – Guidelines For Prevention Of Mold Growth On Gypsum Board (GA-238-03).

(f) Interior paint shall be semi-gloss in all wet areas and the break room and flat in all other areas.

(g) 24" x 24" lay-in Acoustical Ceilings will be used throughout the occupied areas at 9' AFF, unless otherwise noted. Tiles shall be omni-directional, mildew/moisture resistant. Ceilings shall have a minimum noise reduction coefficient NRC of .60.

3.4.5.3 Interior Finishes Table

WAREHOUSE INTERIOR FINISHES															
	FLOORS					BASE		WALLS			CEILING				REMARKS
	RESILIENT FLOORING	CERAMIC TILE	RECESSED ENTRY MAT	CARPET TILE	SEALED CONCRETE	RESILIENT BASE	CERAMIC BASE	GYPSUM WALL BOARD - PAINT	CERAMIC TILE	LAMINATED GLASS, INSUL. STORE FRONT SYSTEM	GYPSUM WALL BOARD - PAINT	PAINTED STRUCTURE	2' X 2' ACOUSTICAL CEILING TILE	MINIMUM-HEIGHT 9'-0" UNLESS STATED OTHERWISE	REFER TO NOTE
WAREHOUSE OPERATIONS AREA AND UTILITY SPACES															
WAREHOUSE					•	•		•				•		32'	NOTE 5
LOADING DOCK					•							•		12'	NOTE 5
TOILET - (UNI-SEX)					•		•	•			•				NOTE 1
JANITOR CLOSET					•						•				NOTE 2
ELECTRICAL ROOM					•	•		•			•			10'	
MECHANICAL ROOM					•	•		•			•			10'	
ADMINISTRATION AREAS															
LOBBY	•					•		•					•		NOTE 7
STAIR	•				•	•		•			•				NOTE 6 & 7
CORRIDORS	•					•		•			•		•		NOTE 7
VESTIBULE	•		•			•		•		•			•		NOTE 7
MULTI-PURPOSE ROOM				•		•		•					•		NOTE 7
OPEN OFFICE AREA				•		•		•					•		NOTE 7
MEN'S RESTROOM		•					•	•	•		•				NOTE 1 & 3
WOMEN'S RESTROOM		•					•	•	•		•				NOTE 1 & 3
BREAK ROOM	•					•		•					•		NOTES 3, 4, & 7
GENERAL STORAGE	•					•		•			•				
TELECOMM	•					•		•			•			10'	
STAIRWELL	•					•		•				•			
JANITOR CLOSET		•					•	•	•		•				NOTE 2
NOTES: 1. All wet walls in toilet rooms shall have 4'-0" high ceramic tile wainscot. Vanity tops shall be cast 100% acrylic polymer solid surfacing material with waterfall front edges. 2. Walls adjacent to janitor's sink shall have a 4'- 0" high ceramic tile wainscot. 3. All counters shall have a minimum of 4" high backsplash. 4. In vending or recyclables storage area, match flooring, wall & ceiling finishes to those of adjacent area. 5. Ceiling may be painted exposed structure if allowed by applicable code. 6. Risers shall be painted steel. Stair landings and treads shall have resilient flooring or sealed concrete. Provide treads with slip resistant nosings. 7. All acoustical ceiling tile shall be installed with hold down clips to prevent upward movement.															

3.5 STRUCTURAL REQUIREMENTS

Design and construct as a complete system in accordance with APPLICABLE CRITERIA.

3.5.1 Live Loads: Design live loads shall be per the IBC but not lower than the following minimums.

- (a) Primary roof members, exposed to work floor (in addition to the uniform load):
Single panel point on lower chord of roof trusses or any point along primary structural members supporting roofs.....2,000 pounds
- (b) Floor slab:
 - (1) Warehouse: The most stringent loading of the following:
 - (a) Uniform load.....300 psf
 - (b) Fork lift with lifting capacity of6,000 lb
 - (c) Pallets with average weight of 1200 lb each will be stacked 6 high in pallets storage racks with the first pallet will be sitting on the floor. (Maximum pallet weight is 2500 lb). Slab shall be designed for all loads induced on slab by racking system.
 - (2) Administration.....80 psf

3.5.2 Column Spacing: Column spacing shall not be less than 25 feet in the long direction of building and 60 feet (in warehouse) in the narrow direction. Columns are to be spaced in such a way as to allow standard industrial shelving for palletized loading. Shelving shall be constructed in a back-to-back double row configuration with no interspersed single rows. Preference is to have no freestanding columns in open warehouse space.

3.5.3 All concrete shall have a minimum 28 days compressive strength of 3,000 psi and shall be steel reinforced. The minimum concrete compressive strength for floors subjected to pneumatic tired traffic will be 4,000 psi; for floors subjected to abrasive traffic such as steel wheels, the minimum concrete compressive strength will be 5,000 psi. Place floor mounted mechanical and electrical equipment on a 4" minimum thickness concrete pad.

3.5.4 Foundation: The foundation is site specific and must be designed upon known geotechnical considerations by an engineer knowledgeable of the local conditions, e.g. highly expansive soils, groundwater levels. All slab-on-grade shall be underlain by a minimum of 10 mil polyethylene membrane vapor barrier over compacted sub-grade. All floors in warehouse bays shall be sealed and hardened during the curing process. Floors throughout the facility shall be classified as "Flat" as defined by ACI 117 and must be finished to the same level not only for the safe installation of shelving, but also for the smooth movement of fork lifts, platform trucks, etc. The concrete floor slabs will be constructed to meet the American Concrete Institute (ACI), Committee 302 tolerances for flatness and levelness.

3.5.5 Site Features – Retaining Walls/ Bridges/ etc.

Design site features, e.g. retaining walls, culverts, bridges, in accordance with the appropriate American Association of State Highway and Transportation Officials (AASHTO) criteria including AASHTO LRFD Bridge Design Specifications, AASHTO Standard Specifications for Highway Bridges, and AASHTO Guide Specifications for Design of Pedestrian Bridges. Consider operation and maintenance requirements, e.g. painting, mowing, inspecting, routine maintenance. Design site features to drain properly in order to meet loading assumptions.

3.5.6 Design Analysis

Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Results must include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.

3.6 MECHANICAL REQUIREMENTS

3.6.1 Plumbing

3.6.1.1 Plumbing system shall be designed and installed in accordance with the International Plumbing Code (IPC). Fixtures shall be of the water saving type and approved for its use per the IPC. Hot water shall be provided for all lavatories. Refer to paragraph 5 for domestic water metering requirements.

3.6.1.2 Gas systems (if applicable) shall be designed and installed in accordance with NFPA 54. Gas fired appliances shall be of the energy saving type. Refer to paragraph 5 for gas metering requirements.

3.6.1.3 Locate emergency eye wash stations in accordance with OSHA standards 1910 and 1926. Water must be heated and a thermostatic tempering valve employed to provide water at the OSHA-required temperature.

3.6.1.4 Provide floor drains in toilets and janitor closets to facilitate proper maintenance.

3.6.1.5 Wall Hydrants: Provide a minimum of 4 exterior wall hydrants, at least one per face of the building. Hydrants shall have a removable key and freeze protection. Wall hydrants shall be mounted 2 feet above finished grade and will be spaced around the building perimeter to allow maintenance with no greater than 100 feet of garden hose.

3.6.2 Heating, Ventilating and Air Conditioning (HVAC)

3.6.2.1 All administrative spaces shall be heated and ventilated. Administrative spaces shall have user adjustable controls of +/- 2 degrees F with a set point of 70 degrees F for heating. Except for communications rooms (see I3A Technical Criteria for requirements), air conditioning is not allowed. Installation shall be in accordance with the International Mechanical Code (IMC). Toilets shall be continuously exhausted during occupied hours.

3.6.2.2 Stand alone DX air conditioning for communications rooms shall remain active at all times. The unit shall be tied into the DDC system.

3.6.2.3 All warehouse spaces shall be heated and ventilated separate from administrative spaces. During cold weather warehouse areas shall be maintained at a minimum of 55 degrees F when occupied. During non-occupied hours the temperature shall be maintained at a minimum of 40 degrees F for freeze protection. The use of gas infrared heat should be considered for open warehouse areas. Air conditioning is not allowed in warehouse areas. Installation shall be in accordance with the IMC. Only freeze protection is required in the fire riser room.

3.6.2.4 Refer to Paragraph 5 for temperature control information.

3.6.2.5 Air handling units shall be located in a mechanical room accessible only through an exterior door. Mechanical rooms shall be sized for ease of service, maintenance, and replacement of HVAC equipment. The design shall be such that the minimum manufacturer's recommended clearances are met with additional clearances necessary for circulation and maintenance access. The design shall also account for minimal disturbance of adjacent and/or surrounding equipment during the equipment removal process. Rooftop-mounted equipment shall be accessible by means of a fully caged roof ladder accessible only from the interior of the building. Provide a lockable, full size roof hatch for the ladder.

3.6.2.6 Heating space zoning shall be based on exterior envelope exposures. Limit individual zones to a maximum of 1,600 cfm.

3.6.2.7 Air handling units shall run continuously during occupied hours. Similarly, outdoor ventilation air required by ASHRAE 62.1 shall be continuous during occupied hours.

3.6.2.8 Equipment located outside (on the ground) shall be enclosed in a security-screened equipment yard. Sound/noise shall be a consideration in the selection of all equipment.

3.6.2.9 For hot weather provide an up-blast, fan-powered (curb-mounted), warehouse ventilation system capable of exhausting stratified hot, stale air trapped below the roofline at a minimum rate of 4 cfm per square foot of under-roof-area open to the warehouse. Cfm rating shall be at no less than 0.125 inch of static pressure. Limit noise level (per exhaust ventilator) to 50 fan sones (measured at 5 feet per AMCA Standard 301, installation A, tested at zero static pressure). Fixed exhaust volume (per ventilator fan) shall fall between 23,000 cfm minimum and 45,000 cfm maximum at 0.125 inch of static pressure. Ventilators shall have a cfm to sone ratio of at least 800 (cfm/sones = 800+). Ventilator ratings, etc. shall come from regularly published data provided by the equipment manufacturer. Locate ventilators to maximize the sweep of fresh air through the warehouse and prevent short-circuiting of air between intake and exhaust points. To minimize condensation, ventilator butterfly dampers shall be made from non-metallic material such as epoxy-fiberglass and have molded-in one-piece metal axles. Provide drip pans to catch any condensate. Provide separate hand/off/auto control for each exhaust ventilator at a convenient single location. Integrate "auto" control into the UMCS leaving "hand/off" as an occupancy override. Base automated operation on a combination of indoor temperature, outdoor temperature and time of day. For purposes of night cool down provide low-wall, rain-resistant, air intake, wall louvers with motorized dampers and insect screens. Size louvers for 3 air changes per hour (based on open warehouse under-roof volume only) to produce a net free area velocity of no more than 500 fpm. If excess airflow is necessary (because of fan sizing) to meet the minimum airflow requirement then louvers must be sized so as to not exceed the 500 fpm maximum. Locate the louvers so as to promote balanced airflow and prevent short circuiting. Interlock fans/dampers so that operation of a single fan or any combination of fans will open all of the dampers. With all fans operating (and all dock doors and dampers open) the velocity through the free area of all louvers and dock doors shall not exceed 500 fpm. To prevent back-drafting of gas-fired appliances interlock ventilators to heating units so that they will not fire if ventilators are energized. Heating unit interlocks are not required for appliances whose combustion air supply does not communicate with the open warehouse space.

3.6.2.10 Per 29 CFR 1910 and other applicable criteria provide for sufficient diffusion and ventilation of gases from fork lift storage batteries to prevent the accumulation of explosive mixtures. Batteries will be charged "in place". Provide charging areas for forklifts and chargers. Forklifts and charging equipment (GFGI) are not included in this project.

3.6.2.11 Administrative space must comply with the thermal comfort criteria required by LEED EQ7.1.

Note:

However, only if the entire building complies with EQ 7.1 will the credit be earned. The mandatory requirement of Paragraph 5.8 that EQ 7.1 be earned for LEED Silver does not apply to this facility.

3.7 ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS

Select electrical characteristics of the power system to provide a safe, efficient, and economical distribution of power based upon the size and types of loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served. The effect of nonlinear loads such as computers, other electronic equipment and electronic ballasts shall be considered and accommodated as necessary.

3.7.1 Power outlets

Interior power shall be provided for all installed equipment requiring power to include convenience receptacles and Government Furnished Government Installed (GFGI) equipments. Refer to paragraph 6 for power requirements of all special equipment such as motorized overhead doors, elevator, and forklift battery chargers, etc.

3.7.1.1 Duplex receptacles shall be provided per NFPA 70 and in conjunction with the proposed equipment and furniture layouts.

3.7.1.2 Each CATV outlet shall have a duplex receptacle mounted adjacent to it.

3.7.1.3 In addition to receptacles required elsewhere in the RFP provide one duplex receptacle per wall in each office for general purpose use.

3.7.1.4 For housekeeping purposes provide a minimum of one 125-volt, 20A duplex receptacle per corridor. No point along corridor wall at 18 inches above finished floor shall be more than 25 feet from a receptacle.

3.7.1.5 Provide duplex receptacles in restrooms.

3.7.1.6 For Break Room area, provide adequate receptacles for the room and counter-top.

3.7.1.7 In addition to the I3A Technical Criteria requirements, two 125 Volt, 20 Amp receptacles each on a dedicated circuit shall be placed on the telephone backboard in each telecommunications room.

3.7.1.8 A minimum of two 125-volt, 20A duplex receptacles shall be provided in each mechanical room and one in each electrical room in addition to NFPA 70 requirements.

3.7.1.9 As required per I3A, provide a duplex receptacle adjacent to each telecommunication outlet.

3.7.1.10 Provide exterior ground fault circuit interrupter duplex receptacles on the building exterior walls near entrances.

3.7.1.11 Provide duplex receptacles in warehouse area. Mount on each column 48" above finished floor. No point along the wall shall be more than 25 feet from a receptacle.

3.7.1.12 Provide exterior ground fault circuit interrupter duplex receptacles for loading dock area installed 18" above finished floor.

3.7.1.13 There will be five (5) occupants in this warehouse. Provide forklift charging station for each occupant.

3.7.1.14 Provide power circuits to forklift battery charger stations. Overcurrent protective devices shall be provided.

3.7.1.15 Static ground shall be provided for the hazardous material storage area.

3.7.1.16 Provide power to elevator per Installation Design Guide, Chapter 6, Project Specific Requirements.

3.7.1.17 Provide adequate duplex receptacles for conference room. In addition to receptacle for GFI equipment, provide two duplex receptacles on each wall minimum.

3.7.1.18 Provide a quadraplex receptacle for each battery charge table for charging hand-tool battery.

3.7.2 Grounding

Grounding shall be provided in accordance with NFPA 70 and the I3A Technical Criteria.

3.7.3 Lighting

Interior lighting shall be as specified below in addition to the requirements of paragraph 5. Design luminance shall meet IESNA and ASHRAE 90.1 requirements. Local manual controls shall supplement automatic controls in offices, large open work spaces and specialized areas such as, warehouse areas. Compact fluorescent lamps of 13 watts or less shall not be used. All interior, other than warehouse area, shall be illuminated by utilizing fluorescent light and electronic ballast.

All High Intensity Discharge (HID) lamps shall have a Color Rendering Index (CRI) above 65.

3.7.3.1 Warehouse area. Emergency lighting shall be provided along exit aisle and walkways. For safety purpose, lighting design shall prevent any shadow effects with equipment operation. Warehouse area is considered as un-conditioning areas. Lighting design should reference to operating temperature in Mechanical section to ensure the adequate lighting level will be provided to maintain IES requirements during hot and cold seasons.

3.7.3.2 Lighting level for conference room shall be 30 foot candles and controlled by dimmers.

3.7.3.3 Mechanical rooms, supply areas and electrical rooms shall be illuminated to a level of 30 foot-candles.

3.7.3.4 Lighting shall be compatible with security cameras and security requirements.

3.7.3.5 Provide dock light for loading dock door. Arm shall be 60 inches minimum in length. Provide housing composed of die cast aluminum and hood with wire guard.

3.7.3.6 In loading dock area, provide Stop and Go light for each loading dock door.

3.7.4 EXTERIOR LIGHTING AROUND BUILDING

All exterior lighting shall be controlled by photocell or timer and manual lighting switches.

3.7.4.1 Provide a wall-mounted light for each door.

3.7.4.2 Provide a Wall Pak light mounted above each garage door.

3.7.4.3 Provide security lighting around the building.

3.7.4.4 Provide lighting for covered dock area. Lighting fixture should be surface mounted at canopy.

3.7.5 TELECOMMUNICATIONS SYSTEM

Telecommunication outlets shall be provided per the I3A Technical Criteria based on functional purpose of the space within the building and in accordance with other provisions of this RFP. The information systems designer must prepare the test plan, and witness and certify the testing of telecommunications cabling. In the I3A Technical Criteria, the word "shall" shall be substituted for the word "should" throughout the document. The I3A Technical Criteria shall be considered to be MANDATORY criteria.

3.7.5.1 Outside Plant Telecommunications Systems. The project's facilities must connect to the Installation telecommunications (voice and data) system through the outside plant (OSP) underground infrastructure per I3A Technical Criteria. Connections to the OSP cabling system shall be from each facility main cross connect located in the main telecommunications room or telecommunications equipment room to the closest OSP access point. Components include the physical cable plant and the supporting structures. Items included under OSP infrastructure encompass, but are not limited to, maintenance hole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, splices, cable vaults, and copper and FO entrance facilities.

3.7.5.2 Provide voice and data connection capability to all workstations.

3.7.5.3 Provide wireless access point (WAP) outlets in warehouse areas with one-Cat 6, unshielded twisted pair (UTP) cable, each to a standard 8-pin modular connector for each wireless WAP outlet. Wiring and WAP outlets shall be installed in accordance with the I3A Technical Criteria.

3.7.5.4 Provide a data outlet at each roll-up door.

3.7.5.5 Provide a data outlet for each projector.

3.7.5.6 Provide a data outlet for each network printer, scanner and copier.

3.7.5.7 Provide communication jacks for elevator.

3.7.5.8 Note to Contractor: parallel internet contractor

3.7.5 CATV

All CATV outlet boxes, connectors, cabling, and cabinets shall conform to applicable criteria unless noted otherwise. All horizontal cabling shall be homerun from the CATV outlet to the nearest telecommunications room. CATV connectivity shall be provided in: private offices. See paragraph 6.0 PROJECT SPECIFIC REQUIREMENTS for additional requirements.

3.7.7 MASS NOTIFICATION

Mass notification system shall meet intelligibility requirements up to a distance of 30' from the building's perimeter and in all court yards. Visible notification appliances are not required on the building's exterior walls.

3.7.8 PAGING SYSTEM

A zoned paging system shall be provided throughout the facility and integrated with the telephone system. System may utilize mass notification amplifiers and speakers, but shall be overridden by the mass notification system if mass notification system is activated while the paging system is being utilized. System shall have a minimum capacity of eight zones. Facility shall be zoned per user requirements.

3.7.9 SECURITY INFRASTRUCTURE (Security Equipment Not in Contract)

The security infrastructure shall be installed to support Government furnished equipment including cameras, door alarms, and motion sensors. These devices will be utilized at all exterior entrances with the exception of utility room entrances. Refer to paragraph 6 for additional information.

3.8 FIRE PROTECTION

3.8.1 Fire suppression systems shall be designed in accordance with the latest edition of UFC 3-600-01. Warehouse and storage areas shall be protected utilizing Early Suppression Fast Response (ESFR) type sprinklers. ESFR shall be designed and installed in accordance with NFPA 13. ESFR system shall be on a separate fire riser from the rest of the building. (Note: maximum roof slope for ESFR is 2/12.)

3.8.2 Fire pumps, if required, shall be installed in accordance with NFPA 20. Fire pumps shall be installed in a separate room with access from the exterior. Fire pump room shall have one hour separation from the rest of the building.

3.8.3 Water storage tanks, if required, shall meet the requirements of UFC 3-600-01 and NFPA 22. Water tanks must be supervised by the building's fire alarm system.

3.8.4 Fire Department Connection (FDC) shall be provided in accordance with NFPA requirements.

3.8.5 Post Indicator Valve (PIV) shall be provided in accordance with NFPA requirements. PIV shall be supervised by the building fire alarm system.

4.0 APPLICABLE CRITERIA

Unless a specific document version or date is indicated, use criteria from the most current references, including any applicable addenda, unless otherwise stated in the contract or task order, as of the date of the Contractor's latest accepted proposal or date of issue of the contract or task order solicitation, whichever is later. In the event of conflict between References and/or Applicable Military Criteria, apply the most stringent requirement, unless otherwise specifically noted in the contract or task order.

4.1. INDUSTRY CRITERIA

Applicable design and construction criteria references are listed in Table 1 below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. See also Paragraph 3 for additional facility-specific applicable criteria.

Table 1: Industry Criteria

Air Conditioning and Refrigeration Institute (ARI)	
ARI 310/380	Packaged Terminal Air-Conditioners and Heat Pumps
ARI 440	Room Fan-Coil and Unit Ventilator
ANSI/ARI 430-99	Central Station Air Handling Units
ARI 445	Room Air-Induction Units
ARI 880	Air Terminals
Air Movement and Control Association (AMCA)	
AMCA 210	Laboratory Methods of Testing Fans for Rating
American Architectural Manufacturers Association (AAMA)	
AAMA 605	Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
AAMA 607.1	Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
AAMA 1503	Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Association of State Highway and Transportation Officials (AASHTO)	
	Roadside Design Guide [guardrails, roadside safety devices]
	Standard Specifications for Transportation Materials and Methods of

	Sampling and Testing [Road Construction Materials]
	Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals
	Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]
	A Policy of Geometric Design of Highways and Streets
American Bearing Manufacturers Association (AFBMA)	
AFBMA Std. 9	Load Ratings and Fatigue Life for Ball Bearings
AFBMA Std. 11	Load Ratings and Fatigue Life for Roller Bearings
American Boiler Manufacturers Association (ABMA)	
ABMA ISEI	Industry Standards and Engineering Information
American Concrete Institute	
ACI 302.2R	Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
ACI 318	Building Code Requirements for Structural Concrete
ACI SP-66	ACI Detailing Manual
ACI 530	Building Code Requirements for Masonry Structures
ADA Standards for Accessible Design	
See US Access Board	ADA and ABA Accessibility Guidelines for Buildings and Facilities, Chapters 3-10.
American Institute of Steel Construction (AISC)	
	Manual of Steel Construction – 13 th Edition (or latest version)
American Iron and Steel Institute	
AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members
American National Standards Institute 11 (ANSI)	

ANSI Z21.10.1	Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less
ANSI Z124.3	American National Standard for Plastic Lavatories
ANSI Z124.6	Plastic Sinks
ANSI Z21.45	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
ANSI/IEEE C2-2007	National Electrical Safety Code
ANSI/AF&PA NDS-2001	National Design Specification for Wood Construction
American Society of Civil Engineers (ASCE)	
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASCE 37	Design and Construction of Sanitary and Storm Sewers, Manuals and Reports on Engineering Practice [sanitary sewer and storm drain design criteria]
ASCE/SEI 31-03	Seismic Evaluation of Existing Buildings [Existing Building Alteration/Renovation]
ASCE/SEI 41-06	Seismic Rehabilitation of Existing Buildings [Existing Building Alteration/Renovation]
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)	
ASHRAE 90.1	ANSI/ASHRAE/IESNA 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Guideline 0	The Commissioning Process
ASHRAE Guideline 1.1	The HVAC Commissioning Process
ASHRAE Handbooks	Fundamentals, HVAC Applications, Systems and Equipment, Refrigeration (Applicable, except as otherwise specified)
ASHRAE Standard 15	Safety Standard for Refrigeration Systems
ASHRAE Standard 62.1	Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy (Design portion is applicable, except where precluded by other project requirements.)

ASHRAE Standard 189.1	Standard for the Design of High-Performance Green Buildings (ANSI Approved; USGBC and IES Co-sponsored) , - (APPLICABLE TO THE EXTENT SPECIFICALLY CALLED OUT IN THE CONTRACT)
American Society of Mechanical Engineers International (ASME)	
ASME BPVC SEC VII	Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers
ASME A17.1	Safety Code for Elevators and Escalators
ASME B 31 (Series)	Piping Codes
American Water Works Association (AWWA)	
	Standards [standards for water line materials and construction]
American Welding Society	
	Welding Handbook
	Welding Codes and Specifications (as applicable to application, see International Building Code for example)
Architectural Woodwork Institute (AWI)	
Latest Version	AWI Quality Standards
Associated Air Balance Council (AABC)	
AABC MN-1	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems
	AABC Associated Air Balance Council Testing and Balance Procedures
ASTM International	
ASTM C1060-90(1997)	Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings
ASTM E 779 (2003)	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
ASTM E1827-96(2002)	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door

Builders Hardware Manufacturers Association (BHMA)	
ANSI/BHMA	The Various BHMA American National Standards
Building Industry Consulting Service International	
	Telecommunications Distribution Methods Manual (TDMM)
	Customer-Owned Outside Plant Design Manual (CO-OSP)
Code of Federal Regulations (CFR)	
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
10 CFR 430	Energy Conservation Program for Consumer Products
Consumer Electronics Association	
CEA 709.1B	Control Network Protocol Specification
CEA 709.3	Free-Topology Twisted-Pair Channel Specification
CEA 852	Tunneling Component Network Protocols Over Internet Protocol Channels
Electronic Industries Association (EIA)	
ANSI/EIA/TIA 568	Structured Cabling Series
ANSI/EIA/TIA 569	Commercial Building Standard for Telecommunications Pathways and Spaces (includes ADDENDA)
ANSI/TIA/EIA-606	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD EIA/TIA 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)	
	Manual on Uniform Traffic Control Devices for Streets and Highways [signage and pavement markings for streets and highways]
FHWA-NHI-01-021	Hydraulic Engineering Circular No. 22, Second Edition, URBAN DRAINAGE DESIGN MANUAL

Illuminating Engineering Society of North America (IESNA)	
IESNA RP-1	Office Lighting
IESNA RP-8	Roadway Lighting
IESNA Lighting Handbook	Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE)	
	Standard for Use of the International System of Units (SI): the Modern Metric System
Standard 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
International Code Council (ICC)	
IBC	<p>International Building Code</p> <p>Note: All references in the International Building Code to the International Electrical Code shall be considered to be references to NFPA 70.</p> <p>All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58.</p> <p>All references in the International Building Code to the International Fire Code and Chapter 9 shall be considered to be references to Unified Facilities Criteria (UFC) 3-600-01.</p>
IMC	<p>International Mechanical Code –</p> <p>Note: For all references to “HEATING AND COOLING LOAD CALCULATIONS”, follow ASHRAE 90.1</p> <p>Note: For all references to “VENTILATION”, follow ASHRAE 62.1</p>
IRC	International Residential Code
IPC	International Plumbing Code
IEC	Energy Conservation Code (IEC) –Applicable only to the extent specifically referenced herein. Refer to Paragraph 5, ENERGY CONSERVATION requirements.
IGC	International Gas Code - not applicable. Follow NFPA 54, National Fuel Gas Code and NFPA 58, Liquefied Petroleum Gas Code.

International Organization for Standardization (ISO)	
ISO 6781:1983	Qualitative detection of thermal irregularities in building envelopes – infrared method
LonMark International (LonMark)	
LonMark Interoperability Guidelines	(available at www.lonmark.org), including: Application Layer Guidelines, Layer 1-6 Guidelines, and External Interface File (XIF) Reference Guide
LonMark Resource Files	(available at www.lonmark.org), including Standard Network Variable Type (SNVT) definitions
Metal Building Manufacturers Association (MBMA)	
	Metal Building Systems Manual
Midwest Insulation Contractors Association (MICA)	
	National Commercial and Industrial Insulation Standards Manual
National Association of Corrosion Engineers International (NACE)	
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0185	Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe
NACE RP0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines
National Electrical Manufacturers Association (NEMA)	
National Environmental Balancing Bureau (NEBB)	
	Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems
National Fire Protection Association (NFPA)	
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 13	Installation of Sprinkler Systems

NFPA 13R	Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems
NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 20	Installation of Centrifugal Fire Pumps
NFPA 24 NFPA 25	Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design] Inspection, Testing And Maintenance Of Water-Based Fire Protection Systems
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 31	Installation of Oil Burning Equipment
NFPA 54	National Fuel Gas Code
NFPA 58	Liquefied Petroleum Gas Code
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 76	Fire Protection of Telecommunications Facilities
NFPA 80	Standard for Fire Doors and Fire Windows
NFPA 90a	Installation of Air Conditioning and Ventilating Systems
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	Life Safety Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
National Roofing Contractor's Association (NRCA)	
	Roofing and Waterproofing Manual
National Sanitation Foundation, International	

NSF/ANSI Std. 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 36, 37, 51, 52, 59, 169	Food Equipment Standards
ANSI/UL Std. 73, 197, 471, 621, 763	Food Equipment Standards
CSA Std. C22.2 No. 109, 120, 195	Food Equipment Standards
Occupational Safety and Health Administration (OSHA)	
Title 29, Part 1926	OSHA Construction Industry Standards, Title 29, Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction
Plumbing and Drainage Institute (PDI)	
PDI G 101	Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
PDI WH201	Water Hammer Arrestors
Precast Concrete Institute	
PCI Design Handbook	Precast and Prestressed Concrete
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)	
SMACNA HVAC Duct Construction Standards	HVAC Duct Construction Standards - Metal and Flexible
SMACNA Architectural Manual	Architectural Sheet Metal Manual
SMACNA HVAC TAB	HVAC Systems - Testing, Adjusting and Balancing
State/Local Regulations	
	State Department of Transportation Standard Specifications for Highway and Bridge Construction
	Sedimentation and Erosion Control Design Requirements
	Environmental Control Requirements
	Storm Water Management Requirements

Steel Door Institute (SDI)	
ANSI A250.8/SDI 100	Standard Steel Doors and Frames
Steel Deck Institute	
	SDI Diaphragm Design Manual
Steel Joist Institute	
	Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders
Underwriters Laboratories (UL)	
UL 96A	Installation Requirements for Lightning Protection Systems
UL 300	Standard for Safety for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas
UNITED STATES ACCESS BOARD: U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD	
ADA and ABA Accessibility Guidelines for Buildings and Facilities	<p>ABA Accessibility Standard for DoD Facilities</p> <p>Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10.</p> <p>Use this reference in lieu of IBC Chapter 11.</p> <p>Excluded are:</p> <p>(a) Facilities, or portions of facilities, on a military installation that are designed and constructed for use exclusively by able-bodied military personnel (See Paragraph 3 for any reference to this exclusion).</p> <p>(b) Reserve and National Guard facilities, or portions of such facilities, owned by or under the control of the Department of Defense, that are designed and constructed for use exclusively by able-bodied military personnel. (See paragraph 3 for any reference to this exclusion).</p>
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	
	FDA National Food Code
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED-NC	Green Building Rating System for New Construction & Major Renovations
	Application Guide for Multiple Buildings and On-Campus Building

	Projects
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4.2. MILITARY CRITERIA

The project shall conform to the following criteria. Certain design impacts and features due to these criteria are noted for the benefit of the offeror. However, all requirements of the referenced criteria will be applicable, whether noted or not, unless otherwise specified herein.

4.2.1. Energy Policy Act of 2005 (Public Law 109-58) (applies only to the extent specifically implemented in the contract, which may or may not directly cite or reference EPACT)

4.2.2. Executive Order 12770: Metric Usage In Federal Government

(a) Metric design and construction is required except when it increases construction cost. Offeror to determine most cost efficient system of measurement to be used for the project.

4.2.3. TB MED 530: Occupational and Environmental Health Food Sanitation

4.2.4. Unified Facilities Criteria (UFC) 3-410-01FA: Heating, Ventilating, and Air Conditioning - applicable only to the extent specified in paragraph 5, herein.

4.2.5. Deleted.

4.2.6. UFC 3-600-01 Design: Fire Protection Engineering for Facilities. Use the latest edition of the IBC in coordination with this UFC. Use Chapters 3, 6, 7, 33 and UFC 3-600-01. If any conflict occurs between these Chapters and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence. Use UFC 3-600-01 in lieu of IBC Chapters 4, 8,9,10.

4.2.7. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings

4.2.8. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse (Use most recent version, regardless of references thereto in other publications)

(a) Note the option to use tie force method or alternate path design for Occupancy Category II.

4.2.9. UFC 4-021-01 Design and O&M: Mass Notification Systems

4.2.10. Technical Criteria for Installation Information Infrastructure Architecture (I3A)

(a) Email: DetrickISECI3Aguide@conus.army.mil

4.2.11. U.S. Army Information Systems Engineering Command (USAISEC) SECRET Internet Protocol (IP) Router Network (SIPRNET) Technical Implementation Criteria (STIC).. See Paragraph 3 for applicability to specific facility type. May not apply to every facility. This is mandatory criteria for those facilities with SIPRNET.

4.2.11.1. Draft Guide Specification for Section 27 05 28 PROTECTIVE DISTRIBUTION SYSTEM (PDS) FOR SIPRNET COMMUNICATIONS SYSTEMS, found at http://mrsi.usace.army.mil/rfp/Shared%20Documents/SECTION_270528-v3.pdf

5.0 GENERAL TECHNICAL REQUIREMENTS

This paragraph contains technical requirements with general applicability to Army facilities. See also Paragraph 3 for facility type-specific operational, functional and technical requirements. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed.

5.1. SITE PLANNING AND DESIGN

5.1.1. STANDARDS AND CODES: The site planning and design shall conform to APPLICABLE CRITERIA and to paragraph 6, PROJECT SPECIFIC REQUIREMENTS.

5.1.2. SITE PLANNING OBJECTIVES: Group buildings in configurations that create a sense of community and promote pedestrian use. See paragraph 3 for additional site planning requirements relating to building functions.

5.1.2.1. Provide enclosures and or visual screening devices for Outdoor Utility such as dumpsters, emergency generators, transformers, heating, ventilation, and air conditioning units from streetscape and courtyard views to limit visual impact. Enclosures shall be compatible with the building they serve and accessible by vehicle. The location of dumpsters can have a significant visual impact and should be addressed as part of an overall building design and incorporated in site planning.

5.1.2.2. Where included in the project, dumpster pads shall be concrete (minimum of 8 inches thick on 4 inch base course, unless site conditions dictate more conservative requirements) and directly accessible by way of a paved service drive or parking lot with adequate overhead clearance for collection vehicles. Provide space at dumpster areas for recycling receptacles. Coordinate with Installation on recycling receptacle types, sizes and access requirements and provide space at dumpster areas to accommodate them.

5.1.2.3. Vehicular Circulation. Apply design vehicle templates provided by the American Association of State Highway and Transportation Officials (AASHTO) to the site design. The passenger car class includes passenger cars and light trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational – privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Provide vehicle clearances required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Provide required traffic control signage. Site entrances and site drive aisles shall maximize spacing between drives, incorporate right-angle turns, and limit points of conflict between traffic. Design Services Drives to restrict access to unauthorized vehicles by removable bollards, gates, or other barriers to meet Anti-Terrorism/Force Protection (ATFP) requirements. Orient service drives to building entrances other than the primary pedestrian entry at the front of the building.

5.1.2.4. Provide Emergency Vehicle Access around the facility and shall be in accordance with AT/FP requirements. Maintain a 33-foot clear zone buffer for emergency vehicles, designed to prevent other vehicles from entering the AT/FP standoff to the building.

5.1.2.5. Clear and grub all trees and vegetation necessary for construction; but, save as many trees as possible. Protect trees to be saved during the construction process from equipment.

5.1.2.6. Stormwater Management. Employ design and construction strategies (Best Management Practices) that reduce stormwater runoff, reduce discharges of polluted water offsite and maintain or restore predevelopment hydrology with respect to temperature, rate, volume and duration of flow to the maximum extent practicable. See paragraph 6, PROJECT SPECIFIC requirements for additional information.

5.1.3. EXTERIOR SIGNAGE: Provide exterior signage in accordance with Appendix H, Exterior Signage. Provide exterior NO SMOKING signage that conveys building and grounds smoking policy.

5.1.4. EXISTING UTILITIES: Base utilities maps and capacities for this site are included as part of this RFP. See paragraph 6 for more detailed information.

5.2. SITE ENGINEERING

5.2.1. STANDARDS AND CODES: The site engineering shall conform to APPLICABLE CRITERIA.

5.2.2. SOILS:

5.2.2.1. A report has been prepared to characterize the subsurface conditions at the project site and is **appended to these specifications**. The report provides a general overview of the soil and geologic conditions with detailed descriptions at discrete boring locations. The Contractor's team shall include a licensed geotechnical engineer to interpret the report and develop earthwork and foundation recommendations and design parameters in which to base the contractor's design. If any additional subsurface investigation or laboratory analysis is required to better characterize the site or develop the final design, the Contractor shall perform it under the direction of a licensed geotechnical engineer. There will be no separate payment for the cost of additional tests. If differences between the Contractor's additional subsurface investigation and the government provided soils report or the reasonably expected conditions require material revisions in the design, an equitable adjustment may be made, in accordance with the provisions of the Differing Site Conditions clause. The basis for the adjustment would be the design and construction appropriate for the conditions described in the Government furnished report or the reasonably expected conditions, in comparison with any changes required by material differences in the actual conditions encountered, in accordance with the terms of contract clause Differing Site Conditions.

5.2.2.2. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal, as described in Section 01 33 16, *Design After Award*.

5.2.3. VEHICLE PAVEMENTS: (as applicable to the project)

5.2.3.1. Design procedures and materials shall conform to one of the following: 1) the USACE Pavement Transportation Computer Assisted Structural Engineering (PCASE) program, 2) American Association of State Highway and Transportation Officials (AASHTO) or, 3) the applicable state Department of Transportation standards in which the project is located. See paragraph 5.2.2.2 and Section 01 33 16 for required information for the Contractor's geotechnical evaluation report. The minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base or as required by the pavement design, whichever is greater, unless specifically identified by the Government to be a gravel road. Design roads and parking areas for a life expectancy of 25 years with normal maintenance. Parking area for tactical vehicles (as applicable to the project) shall be Portland Cement Concrete (PCC) rigid pavement design. For concrete pavements, submit joint layout plan for review and concurrence. Design pavements for military tracked vehicles (as applicable to the project) IAW USACE PCASE. Traffic estimates for each roadway area will be as shown on the drawings or listed in Section 01 10 00 Paragraph 6.4.4. Pavement markings and traffic signage shall comply with the Installation requirements and with the Manual on Uniform Traffic Control Devices.

5.2.3.2. Parking Requirements.

(a) All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces.

(b) Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.

5.2.3.3. Sidewalks. Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable and/or paragraph 6 and/or site plans, where applicable..

5.2.4. CATHODIC PROTECTION: Provide cathodic protection systems for all underground metallic systems and metallic fittings/portions of non-metallic, underground systems, both inside and outside the building 5 foot line that are subject to corrosion. Coordinate final solutions with the installation to insure an approach that is consistent with installation cathodic protection programs.

5.2.5. UTILITIES: See paragraph 6.4.6 for specific information on ownership of utilities and utility requirements. Meter all utilities (gas, water, and electric, as applicable) to each facility. For Government owned utilities, install meters that are wireless data transmission capable as well as have a continuous manual reading option. All meters will be capable of at least hourly data logging and transmission and provide consumption data for gas, water, and

electricity. Gas and electric meters will also provide demand readings based on consumption over a maximum of any 15 minute period. Configure all meters to transmit at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation.

5.2.6. PERMITS: The CONTRACTOR shall be responsible for obtaining all permits (local, state and federal) required for design and construction of all site features and utilities.

5.2.7. IRRIGATION. Landscape irrigation systems, if provided, shall comply with the following:

5.2.7.1. Irrigation Potable Water Use Reduction. Reduce irrigation potable water use by 100 percent using LEED credit WE1.1 baseline (no potable water used for irrigation), except where precluded by other project requirements.

5.2.8. EPA WATERSENSE PRODUCTS AND CONTRACTORS. Except where precluded by other project requirements, use EPA WaterSense labeled products and irrigation contractors that are certified through a WaterSense labeled program where available.

5.3. ARCHITECTURE AND INTERIOR DESIGN:

This element will be evaluated per APPLICABLE CRITERIA under the quality focus.

5.3.1. STANDARDS AND CODES: The architecture and interior design shall conform to APPLICABLE CRITERIA.

5.3.2. GENERAL: Overall architectural goal is to provide a functional, quality, visually appealing facility that is a source of pride for the installation and delivered within the available budget and schedule.

5.3.3. COMPUTATION OF AREAS: See APPENDIX Q for how to compute gross and net areas of the facility(ies).

5.3.4. BUILDING EXTERIOR: Design buildings to enhance or compliment the visual environment of the Installation. Where appropriate, reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Exterior colors shall conform to the Installation requirements. See paragraph 6.

5.3.4.1. Building Numbers: Permanently attach exterior signage on two faces of each building indicating the assigned building number or address. Building number signage details and locations shall conform to Appendix H, Exterior Signage.

5.3.5. BUILDING INTERIOR

5.3.5.1. Space Configuration: Arrange spaces in an efficient and functional manner in accordance with area adjacency matrices.

5.3.5.2. Surfaces: Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.

5.3.5.3. Color: The color, texture and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordinate the building colors and finishes for a cohesive design. Select colors appropriate for the building type. Use color, texture and pattern to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Select finishes with regards to aesthetics, maintenance, durability, life safety and image. Limit the number of similar colors for each material. Use medium range colors for ceramic and porcelain tile grout to help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked or speckled. Coordinate finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms / warning lights, emergency lighting, and other miscellaneous items with the building interior. Match color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) the ceiling color.

5.3.5.4. Circulation: Circulation schemes must support easy way finding within the building.

5.3.5.5. Signage: Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plan shall be from one manufacturer. Include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identification Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards (8) NO SMOKING signage that conveys building smoking policy. Use of emblems or logos may also be incorporated into the signage plan.

5.3.5.6. Window Treatment: Provide interior window treatments with adjustable control in all exterior window locations for control of day light coming in windows or privacy at night. Maintain uniformity of treatment color and material to the maximum extent possible within a building.

5.3.5.7. Casework: Unless, otherwise specified, all casework for Cabinetry and cases shall be "custom grade", as described in the AWI Quality Standards.

5.3.6. COMPREHENSIVE INTERIOR DESIGN

5.3.6.1. Comprehensive Interior Design includes the integration of a Structural Interior Design (SID) and a Furniture, Fixtures and Equipment (FF&E) design and package. SID requires the design, selection and coordination of interior finish materials that are integral to or attached to the building structure. Completion of a SID involves the selection and specification of applied finishes for the building's interior features including, but not limited to, walls, floors, ceilings, trims, doors, windows, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package includes finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build out. The SID also provides basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. See Section 01 33 16 for SID design procedures.

5.3.6.2. The FF&E design and package includes the design, selection, color coordination and of the required furnishing items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility coordinated with the interior finish materials in the SID. The FF&E package includes the specification, procurement documentation, placement plans, ordering and finish information on all freestanding furnishings and accessories, and a cost estimate. Coordinate the selection of furniture style, function and configuration with the defined requirements. Examples of FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens. Criteria for furniture selection include function and ergonomics, maintenance, durability, sustainability, comfort and cost. See Section 01 33 16 for FFE design procedures.

5.4. STRUCTURAL DESIGN

5.4.1. STANDARDS AND CODES: The structural design shall conform to APPLICABLE CRITERIA.

5.4.2. GENERAL: The structural system must be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Do not locate columns, for instance, in rooms requiring visibility, circulation or open space, including, but not limited to entries, hallways, common areas, classrooms, etc. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. Analyze, design and detail each building as a complete structural system. Design structural elements to preclude damage to finishes, partitions and other frangible, non-structural elements to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable of the applicable material standard, e.g., ACI, AISC, Brick Industry Association, etc. When modular units or other pre-fabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.

5.4.3. LOADS: See paragraph 3 for facility specific (if applicable) and paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C for wind. If not specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section "Design After Award". Design the ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, systems and equipment bracing, ducting, piping, etc. for gravity, seismic, lateral loads and for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

- (a) Supporting members of glazed elements, e.g. window jamb, sill, header
- (b) Connections of glazed element to supporting members, e.g. window to header
- (c) Connections of supporting members to each other, e.g. header to jamb
- (d) Connections of supporting members to structural system, e.g. jamb to foundation.

5.4.4. TERMITE TREATMENT: (Except Alaska) Provide termite prevention treatment in accordance with Installation and local building code requirements, using licensed chemicals and licensed applicator firm.

5.5. THERMAL PERFORMANCE

5.5.1. STANDARDS AND CODES: Building construction and thermal insulation for mechanical systems shall conform to APPLICABLE CRITERIA.

5.5.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT. Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. The use of painted interior walls is not an acceptable air barrier method.

5.5.2.1. Trace a continuous plane of air-tightness throughout the building envelope and make flexible and seal all moving joints.

5.5.2.2. The air barrier material(s) must have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178

5.5.2.3. Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.

5.5.2.4. Support the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage, and transfer the load to the structure.

5.5.2.5. Seal all penetrations of the air barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly.

5.5.2.6. The air barrier must be durable to last the anticipated service life of the assembly.

5.5.2.7. Do not install lighting fixtures with ventilation holes through the air barrier

5.5.2.8. Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers at elevator shafts. Coordinate the motorized elevator hoistway vent damper(s) with the Fire Protection System design in paragraph 5.10. Ensure that the damper(s) is accessible to facilitate regular inspection and maintenance.

5.5.2.9. Damper and control to close all ventilation or make-up air intakes and exhausts, , etc., when leakage can occur during inactive periods. Atrium smoke exhaust and intakes shall only open when activated per IBC and other applicable Fire Code requirements.

5.5.2.10. Compartmentalize garages under buildings by providing air-tight vestibules at building access points.

5.5.2.11. Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.

5.5.2.12. Performance Criteria and Substantiation: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:

(a) Develop an Air Barrier Quality Control plan to assure that a competent air barrier inspector/specialist inspects the critical components prior to them being concealed. At a minimum, three onsite inspections are required during construction to assure the completeness of the construction and design.

(b) Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed 0.25cfm/ft² at a pressure differential of 0.3" w.g.(75 Pa) in accordance with ASTM's E 779 (2003) or E-1827-96 (2002). Accomplish tests using both pressurization and depressurization.. Divide the volume of air leakage in cfm @ 0.3" w.g. (L/s @ 75 Pa) by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in cfm/ft² @ 0.3" w.g. (L/s.m² @ 75 Pa). Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.

(c) Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in (a) above.

(d) Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.

5.6. PLUMBING

5.6.1. STANDARDS AND CODES: The plumbing system shall conform to APPLICABLE CRITERIA.

5.6.2. PRECAUTIONS FOR EXPANSIVE SOILS: Where expansive soils are present, include design features for underslab piping systems and underground piping serving chillers, cooling towers, etc, to control forces resulting from soil heave. Some possible solutions include, but are not necessarily limited to, features such as flexible expansion joints, slip joints, horizontal offsets with ball joints, or multiple bell and spigot gasketed fittings. For structurally supported slabs, suspend piping from the structure with adequate space provided below the pipe for the anticipated soil movement.

5.6.3. HOT WATER SYSTEMS: For Hot Water heating and supply, provide a minimum temp of 140 Deg F in the storage tank and a maximum of 110 Deg F at the fixture, unless specific appliances or equipment specifically require higher temperature water supply.

5.6.4. SIZING HOT WATER SYSTEMS: Unless otherwise specified or directed in paragraph 3, design in accordance with ASHRAE Handbook Series (appropriate Chapters), ASHRAE Standard 90.1, and the energy conservation requirements of the contract. Size and place equipment so that it is easily accessible and removable for repair or replacement.

5.6.5. JANITOR CLOSETS: In janitor spaces/room/closets, provide at minimum, a service sink with heavy duty shelf and wall hung mop and broom rack(s).

5.6.6. FLOOR DRAINS: As a minimum, provide floor drains in mechanical rooms and areas, janitor spaces/rooms/closets and any other area that requires drainage from fixtures or equipment, drain downs, condensate, as necessary.

5.6.7. URINALS: Urinals shall be non-water type, conforming to ASHRAE Standard 189.1. Non-Water type shall include sealed replaceable cartridge or integral liquid seal trap. Either non-water type urinal shall use a biodegradable liquid to provide the seal and maintain a sanitary and odor-free environment. Install, test and maintain in accordance with manufacturer's recommendations. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4 inch per foot. Do not use copper tube or pipe for drain lines that connect to the urinal. Manufacturer shall provide an operating manual and on-site training to installation operations personnel for the proper care and maintenance of the urinal. Do not provide non-water type urinals for barracks type or other living spaces. Those fixtures shall be water-use type, conforming to ASHRAE 189.1 (0.5 gpf/1.9 lpf).

5.6.8. BUILDING WATER USE REDUCTION. Reduce building potable water use in each building 30 percent from the Baseline, using the Manufacturing Performance Requirements for Plumbing Fixtures from the Energy Policy Act of 1992 (Public Law 102-486), except as modified by LEED. See Appendix S. Public lavatory faucets shall deliver a maximum flow rate of 0.5 gallons per minute, when tested in accordance with ASME A 112.18/CSA B125 and use that flowrate as the Baseline figure for calculating the 30 percent reduction requirement from the Baseline.

5.6.9. Do not use engineered vent or Sovent® type drainage systems.

5.6.10. Where the seasonal design temperature of the cold water entering a building is below the seasonal design dew point of the indoor ambient air, and where condensate drip will cause damage or create a hazard, insulate plumbing piping with a vapor barrier type of insulation to prevent condensation. Do not locate water or drainage piping over electrical wiring or equipment unless adequate protection against water (including condensation) damage is provided. Insulation alone is not adequate protection against condensation. Follow ASHRAE Fundamentals Chapter 23, Insulation for Mechanical Systems, IMC paragraph 1107 and International Energy Conservation Code for pipe insulation requirements.

5.6.11. Cover all drain, waste and vent piping to prevent mortar or other debris from being flushed down and blocking pipes during such construction activities.

5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

5.7.1. STANDARDS AND CODES: The electrical systems for all facilities shall conform to APPLICABLE CRITERIA.

5.7.2. MATERIALS AND EQUIPMENT: Materials, equipment and devices shall, as a minimum, meet the requirements of Underwriters Laboratories (UL) where UL standards are established for those items. Wiring for branch circuits shall be copper. Motors larger than one-half horsepower shall be three phase. All electrical systems shall be pre-wired and fully operational unless otherwise indicated. Wall mounted electrical devices (power receptacles, communication outlets and CATV outlets) shall have matching colors, mounting heights and faceplates.

5.7.3. POWER SERVICE: Primary service from the base electrical distribution system to the pad-mounted transformer and secondary service from the transformer to the building service electrical equipment room shall be underground. See paragraph 6 for additional site electrical requirements.

5.7.3.1. Spare Capacity: Provide 10% space for future circuit breakers in all panelboards serving residential areas of buildings and 15% spaces in all other panelboards.

5.7.4. TELECOMMUNICATION SERVICE: Connect the project's facilities to the Installation telecommunications (voice and data) system through the outside plant (OSP) telecommunications underground infrastructure cabling system per the I3A Criteria. Connect to the OSP cabling system from each facility main cross connect located in the telecommunications room.

5.7.5. LIGHTING: Comply with the recommendations of the Illumination Engineering Society of North America (IESNA), the National Energy Policy Act and Energy Star requirements for lighting products..

5.7.5.1. Interior Lighting:

- (a) Reflective Surfaces: Coordinate interior architectural space surfaces and colors with the lighting systems to provide the most energy-efficient workable combinations.
- (b) High Efficiency Fluorescent Lighting: Utilize NEMA premium electronic ballasts and energy efficient fluorescent lamps with a Correlated Color Temperature (CCT) of 4100K. Linear fluorescent and compact fluorescent fixtures shall have a Color Rendering Index of (CRI) of 87 or higher. Fluorescent lamps shall be the low mercury type qualifying as non-hazardous waste upon disposal. Do not use surface mounted fixtures on acoustical tile ceilings. Provide an un-switched fixture with emergency ballast at each entrance to the building.
- (c) Solid State Lighting: Fixtures shall provide lighting with a minimum Correlated Color Temperature (CCT) of 4100K and shall have a Color Rendering Index of (CRI) of 75 or higher. Verify performance of the light producing solid state components by a test report in compliance with the requirements of IESNA LM 80. Verify performance of the solid state light fixtures by a test report in compliance with the requirements of IESNA LM 79. Provide lab results by a NVLAP certified laboratory. The light producing solid state components and drivers shall have a life expectancy of 50,000 operating hours while maintaining at least 70% of original illumination level. Provide a complete five year warranty for fixtures.
- (d) Metal Halide Lighting (where applicable): Metal Halide lamp fixtures in the range of 150-500 Watts shall be pulse start type and have a minimum efficiency rating of 88%.
- (e) Lighting Controls: ANSI/ASHRAE/IESNA 90.1 has specific lighting controls requirements. See Also Appendix T, Functional Area Lighting Control Strategy.
- (f) Exterior Lighting: See paragraph 6.9 for site specific information, if any, on exterior lighting systems. Minimize light pollution and light trespass by not over lighting and use cut-off type exterior luminaries.

5.7.6. TELECOMMUNICATION SYSTEM: Building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA, including but not limited to I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling.. Items included under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.

5.7.6.1. Design, install, label and test all telecommunications systems in accordance with the I3A Criteria and ANSI/TIA/EIA 568, 569, and 606 standards. A Building Industry Consulting Services International (BICSI) Registered Communications Distribution Designer (RCDD) with at least 2 yrs related experience shall develop and stamp telecommunications design, and prepare the test plan. See paragraph 5.8.2.5 for design of environmental systems for Telecommunications Rooms.

5.7.6.2. The installers assigned to the installation of the telecommunications system or any of its components shall be regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. Key personnel; i.e., supervisors and lead installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel. In lieu of BICSI certification, supervisors and installers shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products.

5.7.6.3. Perform a comprehensive end to end test of all circuits to include all copper and fiber optic cables upon completion of the BCS and prior to acceptance of the facility. Provide adequate advanced notification to the COR to allow COR and Installation personnel attendance. The BCS circuits include but are not limited to all copper and fiber optic(FO) entrance cables, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, and workstation outlets. Test in accordance with ANSI/EIA/TIA 568 standards. Use test instrumentation that meets or exceeds the standard. Submit the official test report to include test procedures, parameters tested, values, discrepancies and corrective actions in electronic format. Test and accomplish all necessary corrective actions to ensure that the government receives a fully operational, standards based, code compliant telecommunications system.

5.7.7. LIGHTNING PROTECTION SYSTEM: Provide a lightning protection system where recommended by the Lightning Risk Assessment of NFPA 780, Annex L.

5.8. HEATING, VENTILATING, AND AIR CONDITIONING

5.8.1. STANDARDS AND CODES: The HVAC system shall conform to APPLICABLE CRITERIA.

5.8.2. DESIGN CONDITIONS.

5.8.2.1. Outdoor and indoor design conditions shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1. All Buildings with minimum LEED Silver requirement (or better) will earn LEED Credit EQ 7.1, Thermal Comfort-Design., except where precluded by other project requirements. Where the contract specifies indoor design temperature, airflow, humidity conditions, etc., use those parameters.

5.8.2.2. High Humidity Areas: Design HVAC systems in geographical areas meeting the definition for high humidity in UFC 3-410-01FA to comply with the special criteria therein for humid areas.

5.8.2.3. Cooling equipment may be oversized by up to 15 percent to account for recovery from night setback. Heating equipment may be oversized by up to 30 percent to account for recovery from night setback. Design single zone systems and multi-zone systems to maintain an indoor design condition of 50% relative humidity for cooling only. For heating only where the indoor relative humidity is expected to fall below 20% for extended periods, add humidification to increase the indoor relative humidity to 30%. Provide ventilation air from a separate dedicated air handling unit (DOAU) for facilities using multiple single zone fan-coil type HVAC systems. Do not condition outside air through fan coil units. In Air handlers that handle outdoor air and have fans that run continuously during the occupied mode, direct expansion cooling coils may be used only if the controls and compressor technology is provided that allows the compressor to operate down to 10% of full load without utilizing hot gas bypass to minimize the potential of delivering unconditioned outdoor air to the space.

5.8.2.4. Locate all equipment so that service, adjustment and replacement of controls or internal components are readily accessible for easy maintenance.

5.8.2.5. Environmental Requirements for Telecommunications Rooms and Telecommunications Equipment Rooms, (including SIPRNET ROOMS, where applicable for specific facility type). Comply with ANSI/EIA/TIA 569 (including applicable Addenda). Maintain environmental conditions at the Class 1 and 2 Recommended Operating Environment. Before being introduced into the room, filter and pre-condition outside air to remove particles with the minimum MERV filtration quality shown in the ASHRAE HVAC Applications, Chapter 17. Maintain rooms under positive pressure relative to surrounding spaces. Design computer room air conditioning units specifically for telecommunications room applications. Build and test units in accordance with the requirements of ANSI/ASHRAE Standard 127. A complete air handling system shall provide ventilation, air filtration, cooling and dehumidification, humidification (as determined during the design phase), and heating. The system shall be independent of other facility HVAC systems and shall be required year round.

5.8.2.6. Fire dampers: dynamic type with a dynamic rating suitable for the maximum air velocity and pressure differential to which the damper is subjected. Test each fire damper with the air handling and distribution system running.

5.8.3. BUILDING AUTOMATION SYSTEM. Provide a Building Automation System consisting of a building control network, and integrate the building control network into the UMCS as specified.

The building control network shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) systems as specified herein. The building control network shall be an Open implementation of LONWORKS® technology using ANSI/EIA 709.1B as the only communications protocol and use only LonMark Standard Network Variable Types (SNVTs), as defined in the LonMark® Resource Files, for communication between DDC Hardware devices to allow multi-vendor interoperability.

5.8.3.1. The building automation system shall be open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original Contractor. This includes, but is not limited to the following:

- (a) Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.
- (b) Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.8.3.2. All DDC Hardware shall:

- (a) Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.
- (b) Communicate over the control network via ANSI/EIA 709.1B exclusively.
- (c) Communicate with other DDC hardware using only SNVTs
- (d) Conform to the LonMark® Interoperability Guidelines.
- (e) Be locally powered; link power (over the control network) is not acceptable.
- (f) Be fully configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself to support the application. All settings and parameters used by the application shall be configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself
- (g) Provide input and output SNVTs required to support monitoring and control (including but not limited to scheduling, alarming, trending and overrides) of the application. Required SNVTs include but are not limited to: SNVT outputs for all hardware I/O, SNVT outputs for all setpoints and SNVT inputs for override of setpoints.
- (h) To the greatest extent practical, not rely on the control network to perform the application.
- (i) Provide on board nonvolatile memory for devices accumulating energy consumption.

5.8.3.3. Controllers shall be Application Specific Controllers whenever an ASC suitable for the application exists. When an ASC suitable for the application does not exist use programmable controllers or multiple application specific controllers.

5.8.3.4. Application Specific Controllers shall be LonMark Certified whenever a LonMark Certified ASC suitable for the application exists. For example, VAV controllers must be LonMark certified.

5.8.3.5. Application Specific Controllers (ASCs) shall be configurable via an LNS plug-in whenever t an ASC with an LNS plug-in suitable for the application exists.

5.8.3.6. Each scheduled system shall accept a network variable of type SNVT_occupancy and shall use this network variable to determine the occupancy mode. If the system has not received a value to this network variable for more than 60 minutes it shall default to a configured occupancy schedule.

5.8.3.7. Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling one and only one package unit.

5.8.3.8. Not Used

5.8.3.9. Perform all necessary actions needed to fully integrate the building control system. These actions include but are not limited to:

- Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.
- Install IP routers or ANSI/CEA-852 routers as needed to connect the building control network to the UMCS IP network. Routers shall be capable of configuration via DHCP and use of an ANSI/CEA-852 configuration server

but shall not rely on these services for configuration. All communication between the UMCS and building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852.

5.8.3.10. Provide the following to the Government for review prior to acceptance of the system:

- The latest version of all software and user manuals required to program, configure and operate the system.
- Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum:
 - Device address and NodeID.
 - Input and Output SNVTs including SNVT Name, Type and Description.
 - Hardware I/O, including Type (AI, AO, BI, BO) and Description.
 - Alarm information including alarm limits and SNVT information.
 - Supervisory control information including SNVTs for trending and overrides.
 - Configuration parameters (for devices without LNS plug-ins) Example Points Schedules are available at <https://eko.usace.army.mil/fa/besc/>
- Riser diagram of the network showing all network cabling and hardware. Label hardware with ANSI.CEA-709.1 addresses, IP addresses, and network names.
- Control System Schematic diagram and Sequence of Operation for each HVAC system.
- Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.
- LONWORKS® Network Services (LNS®) database for the completed system.
- Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative

Table 5-1: QC Checklist

Instructions: Initial each item, sign and date verifying that the requirements have been met.		
#	Description	Initials
1	All DDC Hardware is installed on a TP/FT-10 local control bus.	
2	Communication between DDC Hardware is only via EIA 709.1B using SNVTs. Other protocols and network variables other than SNVTs have not been used.	
3	All sequences are performed using DDC Hardware.	
4	LNS Database is up-to-date and accurately represents the final installed system	
5	All software has been licensed to the Government	
6	M&C software monitoring displays have been created for all building systems, including all override and display points indicated on Points Schedule drawings.	
7	Final As-built Drawings accurately represent the final installed system.	
8	O&M Instructions have been completed and submitted.	
9	Connections between the UMCS IP network and ANSI/CEA-709.1B building networks are through ANSI/CEA-852 Routers.	
By signing below I verify that all requirements of the contract, including but not limited to the above, been met.		
Signature: _____ Date: _____		

5.8.3.11. Perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. During the PVT demonstrate that the system performs as specified, including but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

5.8.3.12. Provide a 1 year unconditional warranty on the installed system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.

5.8.3.13. Provide training at the project site on the installed building system Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the

system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

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5.8.4. TESTING, ADJUSTING AND BALANCING. Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting, and Balancing Bureau (TABB). The prime contractor shall hire the TAB firm directly, not through a subcontractor. Perform TAB in accordance with the requirements of the standard under which the TAB Firm's qualifications are approved, i.e., AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB Standard shall be considered mandatory. Use the provisions of the TAB Standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB Standard for all aspects of TAB, including qualifications for the TAB Firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB Standard, adhere to the manufacturer's recommendations. All quality assurance provisions of the TAB Standard such as performance guarantees shall be part of this contract. For systems or system components not covered in the TAB Standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB Standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

5.8.5. COMMISSIONING: Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Enhanced commissioning, in accordance with ASHRAE Guideline 1.1, ASHRAE Guideline 0 and LEED. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Hire the Commissioning Authority (CxA), certified as a CxA by AABC, NEBB, or TABB, as described in Guideline 1.1. The CxA will be an independent subcontractor and not an employee of the Contractor nor an employee or subcontractor of any other subcontractor on this project, including the design professionals (i.e., the DOR or their firm(s)). The CxA will communicate and report directly to the Government in execution of commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0. Because required CxA contractual relationship may not be acceptable to GBCI for LEED certification, the project cannot earn LEED Credit EA3 Enhanced Commissioning. However, still complete, maintain and provide copies of all necessary LEED documentation for Credit EA 3. This LEED Credit cannot be included to meet the required LEED rating for this project. Contractor may attempt this as an additional credit for GBCI certification but the Government will not accept it until GBCI accepts it.

5.9. ENERGY CONSERVATION

5.9.1. The building including the building envelope, HVAC systems, service water heating, power, and lighting systems shall meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.2. Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the buildings, including the building envelope, HVAC systems, service water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.3. Purchase Energy Star products, except use FEMP designated products where FEMP is applicable to the type product. The term "Energy Star product" means a product that is rated for energy efficiency under an Energy Star program. The term "FEMP designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent of equivalent products for energy efficiency. When selecting integral sized electric motors, choose NEMA PREMIUM type motors that conform to NEMA MG 1, minimum Class F insulation system. Motors with efficiencies lower than the NEMA PREMIUM standard may only be used in unique applications that require a high constant torque speed ratio (e.g., inverter duty or vector duty type motors that conform to NEMA MG 1, Part 30 or Part 31).

5.9.4. Solar Hot Water Heating. Provide at least 30% of the domestic hot water requirements through solar heating methodologies, unless the results of a Life Cycle Cost Analysis (LCCA) developed utilizing the Building Life

Cycle Cost Program (BLCC) which demonstrates that the solar hot water system is not life cycle cost effective in comparison with other hot water heating systems. The type of system will be established during the contract or task order competition and award phase, including submission of an LCCA for government evaluation to justify non-selection of solar hot water heating. The LCCA uses a study period of 25 years and the Appendix K utility cost information. The LCCA shall include life cycle cost comparisons to a baseline system to provide domestic hot water without solar components, analyzing at least two different methodologies for providing solar hot water to compare against the baseline system.

5.9.5. Process Water Conservation. When potable water is used to improve a building's energy efficiency, employ lifecycle cost effective water conservation measures, except where precluded by other project requirements.

5.9.6. Renewable Energy Features. The Government's goal is to implement on-site renewable energy generation for Government use when lifecycle cost effective. See Paragraph 6, PROJECT SPECIFIC REQUIREMENTS for renewable energy requirements for this project.

5.10. FIRE PROTECTION

5.10.1. STANDARDS AND CODES Provide the fire protection system conforming to APPLICABLE CRITERIA.

5.10.2. Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.

5.10.3. Fire Extinguisher Cabinets: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers. The Government will furnish and install portable fire extinguishers, which are personal property, not real property installed equipment.

5.10.4. Fire alarm and detection system: Required fire alarm and detection systems shall be the addressable type. Fire alarm initiating devices, such as smoke detectors, heat detectors and manual pull stations shall be addressable. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc. shall be zoned by type and by room location.

5.10.5. Roof Access: Paragraph 2-9 of UFC 3-600-01 Fire Protection for Facilities will be modified in the next update to that UFC. Pending revision, comply with roof access and stairway requirements in accordance with the International Building Code. Where roof access is required by the IBC or other criteria, comply with UFC 4-010-01, Anti-Terrorist Force Protection, Standard 14. "Roof Access".

5.10.6. Fire Protection Engineer Qualifications: In accordance with UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES, the fire protection engineer of record shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES), or a registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified with documentation.

5.11. SUSTAINABLE DESIGN

5.11.1. STANDARDS AND CODES: Sustainable design shall conform to APPLICABLE CRITERIA. See paragraph 6, PROJECT-SPECIFIC REQUIREMENTS for which version of LEED applies to this project. The LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (AGMBC) applies to all projects. Averaging may be used for LEED compliance as permitted by the AGMBC but is restricted to only those buildings included in this project. Each building must individually comply with the requirements of paragraphs ENERGY CONSERVATION and BUILDING WATER USE REDUCTION.

5.11.2. LEED RATING, REGISTRATION, VALIDATION AND CERTIFICATION: See Paragraph PROJECT-SPECIFIC REQUIREMENTS for project minimum LEED rating/achievement level, for facilities that are exempt from

the minimum LEED rating, for LEED registration and LEED certification requirements and for other project-specific information and requirements.

5.11.2.1. Innovation and Design Credits. LEED Innovation and Design (ID) credits are acceptable only if they are supported by formal written approval by GBCI (either published in USGBC Innovation and Design Credit Catalog or accompanied by a formal ruling from GBCI). LEED ID credits that require any Owner actions or commitments are acceptable only when Owner commitment is indicated in paragraph PROJECT-SPECIFIC REQUIREMENTS or Appendix LEED Project Credit Guidance

5.11.3. OPTIMIZE ENERGY PERFORMANCE. : Project must earn, as a minimum, the points associated with compliance with paragraph ENERGY CONSERVATION. LEED documentation differs from documentation requirements for paragraph ENERGY CONSERVATION and both must be provided. For LEED-NC v2.2 projects you may substitute ASHRAE 90.1 2007 Appendix G in its entirety for ASHRAE 90.1 2004 in accordance with USGBC Credit Interpretation Ruling dated 4/23/2008.

5.11.4. COMMISSIONING. See paragraph 5.8.5 COMMISSIONING for commissioning requirements. USACE templates for the required Basis of Design document and Commissioning Plan documents are available at <http://en.sas.usace.army.mil> (click on USACE LEED Commissioning Plan Template) and may be used at Contractor's option.

5.11.5. DAYLIGHTING. Except where precluded by other project requirements, do the following in at least 75 percent of all spaces occupied for critical visual tasks: achieve a 2 percent glazing factor (calculated in accordance with LEED credit EQ8.1) OR earn LEED Daylighting credit, provide appropriate glare control and provide either automatic dimming controls or occupant-accessible manual lighting controls.

5.11.6. LOW-EMITTING MATERIALS. Except where precluded by other project requirements, use materials with low pollutant emissions, including but not limited to composite wood products, adhesives, sealants, interior paints and finishes, carpet systems and furnishings,

5.11.7. CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT. Except where precluded by other project requirements, earn LEED credit EQ 3.1 Construction IAQ Management Plan, During Construction and credit EQ 3.2 Construction IAQ Management Plan, Before Occupancy.

5.11.8. RECYCLED CONTENT. In addition to complying with section RECYCLED/RECOVERED MATERIALS, earn LEED credit MR4.1, Recycled Content, 10 percent except where precluded by other project requirements.

5.11.9. BIOBASED AND ENVIRONMENTALLY PREFERABLE PRODUCTS. Except where precluded by other project requirements, use materials with biobased content, materials with rapidly renewable content, FSC certified wood products and products that have a lesser or reduced effect on human health and the environment over their lifecycle to the maximum extent practicable.

5.11.10. FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM (FB4P). The Farm Security and Rural Investment Act (FSRIA) of 2002 required the U.S. Department of Agriculture (USDA) to create procurement preferences for biobased products that are applicable to all federal procurement (to designate products for biobased content). For all designated products that are used in this project, meet USDA biobased content rules for them except use of a designated product with USDA biobased content is not required if the biobased product (a) is not available within a reasonable time, (b) fails to meet performance standard or (c) is available only at an unreasonable price. For biobased content product designations, see <http://www.biopreferred.gov/ProposedAndFinalItemDesignations.aspx>.

5.12. CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT: Achievement of 50% diversion, by weight, of all non-hazardous C&D waste debris is required. Reuse of excess soils, recycling of vegetation, alternative daily cover, and wood to energy are not considered diversion in this context, however the Contractor must track and report it. A waste management plan and waste diversion reports are required, as detailed in Section 01 57 20.00 10, ENVIRONMENTAL PROTECTION.

5.13. SECURITY (ANTI-TERRORISM STANDARDS): Unless otherwise specified in Project Specific Requirements, only the minimum protective measures as specified by the current Department of Defense Minimum Antiterrorism Standards for Buildings, UFC 4-010-01, are required for this project. The element of those standards

that has the most significant impact on project planning is providing protection against explosives effects. That protection can either be achieved using conventional construction (including specific window requirements) in conjunction with establishing relatively large standoff distances to parking, roadways, and installation perimeters or through building hardening, which will allow lesser standoff distances. Even with the latter, the minimum standoff distances cannot be encroached upon. These setbacks will establish the maximum buildable area. All standards in Appendix B of UFC 4-010-01 must be followed and as many of the recommendations in Appendix C that can reasonably be accommodated should be included. The facility requirements listed in these specifications assume that the minimum standoff distances can be met, permitting conventional construction. Lesser standoff distances (with specific minimums) are not desired, however can be provided, but will require structural hardening for the building. See Project Specific Requirements for project specific siting constraints. The following list highlights the major points but the detailed requirements as presented in Appendix B of UFC 4-010-01 must be followed.

- (a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation
- (b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports
- (c) Progressive collapse resistance for all facilities 3 stories or higher. Unless determined otherwise by the Installation and noted in paragraphs 3 or 6, the building shall be considered to have areas of uncontrolled public access when designing for progressive collapse.
- (d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)
- (e) For facilities with mailrooms (see paragraph 3 for applicability) – mailrooms have separate HVAC systems and are sealed from rest of building

6.0 PROJECT SPECIFIC REQUIREMENTS JOINT BASE LEWIS-MCCORD (JBLM), WA

6.1. GENERAL

The requirements of this paragraph augment the requirements indicated in Paragraphs 3 through 5.

6.2. APPROVED DEVIATIONS

The following are approved deviations from the requirements stated in Paragraphs 3 through 5 that only apply to this project.

None

6.3. SITE PLANNING AND DESIGN

6.3.1. Site Planning Considerations

6.3.1.1. Site Planning, Design, and Construction Objectives: The Contractor is responsible for the site planning, design, and construction of all functional and technical requirements listed in this project, including erosion control measures, underground conduit, piping, sanitary sewer facilities, storm drainage facilities, water mains, fire apparatus, utility service lines and connections (electrical, communications, cable, water, sewer, stormwater, propane/air, gas, mechanical), etc. The site plan shall comply with the Joint Base Lewis McChord (JBLM) Real Property Master Plan (Master Plan), available upon request from the Contracting Officer.

6.3.1.2. Sidewalks: Provide 6-foot-wide minimum paved walkways to the entrance(s) of the building, around the building perimeter or all areas within the building complex, including courtyards.

6.3.2. Site Structures and Amenities

6.3.2.1. Site Furniture and Equipment. Provide the following:

- (a) Exterior seating, as shown on the drawings.. Fabricate seating and tables of corrosion and rot-resistant materials.
- (b) Bicycle racks at all regularly occupied facilities with rack capacities consistent with LEED credit requirements. Provide individual loop style (inverted "U") bicycle racks anchored in concrete and fabricated from 2-inch diameter powder-coated steel pipe.. Place all bike racks outside the unobstructed space per UFC 4-010-1.
- (c) Fencing as indicated on drawings for security or safety barriers. Fencing shall be galvanized, vinyl coated, or aluminum-coated, chain-link with privacy slats.
- (d) Physical barriers, including concrete filled steel pipe bollards and vehicle gates, as required by antiterrorism or traffic control design. Bollards and gates shall not require more than one person to remove or open. Bollards and gates shall have padlocks keyed to accept JBLM master key #750.
- (e) Waste receptacle(s) and recycling receptacle(s), as shown on the drawings. Fabricate waste receptacles of durable, corrosion-resistant materials.
- (f) Flagpoles are required at Brigade and Battalion Headquarters facilities. Provide free-standing poles, 25-feet in height above surrounding ground plane. Flagpoles shall resist a 3-second duration wind gust of 85 mph. Provide brushed natural aluminum, tapered from top to bottom, with 6-inch-diameter aluminum top ball.
- (g) One concrete guidon pedestal for Company flag adjacent to each Company Readiness module.

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

- (a) The Contractor is responsible for design, development, and installation of all stormwater facilities at their respective sites.

(b) Fort Lewis (JBLM) has adopted the Washington State Department of Ecology (Ecology) Western Washington Stormwater Management Manual (Ecology stormwater manual). By adoption, JBLM Department of Public Works (PW) is not transferring regulatory compliance of the design process to Washington State. Send all requests for exceptions from or clarifications of the requirements within the Ecology stormwater manual to JBLM PW for consideration. Use the most current version of the stormwater manual as a guide for stormwater designs.

(c) Management of stormwater must be integrated into other project aspects to meet the sustainability goals of the installation as a whole. Design stormwater systems to maintain the hydrologic functions of the site. Consider reusing stormwater on site for irrigation and landscaping. This contributes to the installation's water savings and reuse goals.

(d) Design and size stormwater facilities to accommodate stormwater runoff from all site development surfaces and all runoff from buildings in conformance with the latest adopted edition of the Ecology stormwater manual. Design goals should be to reduce or eliminate offsite stormwater flows and restore the pre-development hydrology of the project area. Designs must meet all of the requirements below.

1. The designs must comply with Section 438 of the Energy Independence and Security Act (EISA).
2. Fence all standing water facilities with side slopes exceeding 3h:1v for safety. Complete all standing water facilities with a minimum of 6 inches of topsoil and plantings appropriate for the pond function.
3. Within housing, commercial, and organizational areas, ponds cannot be constructed with side slope exceeding 3h:1v or deeper than 2.5 feet.
4. All ponds, swales, or other like stormwater features must be vegetated and/or have amended soils added to provide appropriate function.
5. All ponds, swales, or other like stormwater features shall blend with project landscaping to the maximum extent practicable.
6. Storm drain lines and branches within the site shall be polyvinyl chloride (PVC) plastic, ductile-iron, CPEP, or HDPE pipe.
7. Infiltration rates (including topsoil and vegetation), amended or on-site soils mixes, and seed mixtures should all be addressed in the design.
8. Whenever possible, shrub beds, street plants, and similar features shall be used through rain garden type features for stormwater runoff management.

(e) Onsite treatment and infiltration: Use the Ecology stormwater manual and the Low-Impact Development Technical Manual for Puget Sound. Request any exceptions for approval by JBLM PW. However, consider the portions of Section 3.3 of Volume III of the Ecology stormwater manual pertaining to the methods for determining infiltration rates as a recommended guideline. Conduct on-site soil tests in conformance with standard engineering practices and to the satisfaction of JBLM PW. Use the soil tests to determine a short-term infiltration rate. Once determined, apply appropriate factors of safety in conformance with standard engineering practices to the short-term infiltration rate to arrive at a long-term design infiltration rate based on site conditions, in conformance with the designer's professional opinion and discretion, and the approval of JBLM PW, prior to full design. Include detailed information in the design regarding amended soil mixtures, soil depths, vegetation requirements and seed mixtures for all stormwater management features.

1. JBLM prefers stormwater infiltration methods that are small, distributed throughout the project site, and as visually unobtrusive as possible. Preferred methods include elements such as car parks, rain gardens, porous pavement, cisterns, or other low-impact development elements.
2. Use pervious pavements to infiltrate stormwater for parking areas in housing, commercial, and organizational areas that are not subject to industrial activities or high traffic. If there is runoff that the pervious pavement cannot infiltrate, use car parks or rain gardens to infiltrate this runoff. Car parks shall meet the car park standard for landscape and shading.
3. Use sheet flow runoff to infiltration features to the maximum extent practicable. Consider safety when sheet flowing large amounts of runoff.

(f) The use of underground injection control for stormwater management must meet the requirements of Chapter 173-218 of the Washington Administrative Code (WAC) Underground Injection Control (UIC) Program. Submit completed registration forms to the JBLM Stormwater Office for registration with Ecology 65 days prior to

any construction of UIC facilities. Obtain registration forms and any further information from the JBLM Environmental Division.

(g) Low-impact development techniques shall comply with the Low Impact Development Technical Guidance Manual for Puget Sound.

(c) Low Impact Development and other BMPs. Use of Rain Gardens and LID listed here are preferences and examples based on successes here at JBLM and other local municipalities. These are not meant to restrict the use of practices presented in either the Western Washington Stormwater Guide, LID manual or the Rain Garden guide. Construct parking lots with integrated stormwater infiltration areas.

Bioswales: Depths and slopes need to be strictly managed. No slopes larger than 3:1 are allowed (4:1 recommended for housing, community and administration areas). with the purpose being to allow grounds maintenance activities. Depths should be addressed from the presence of ground water, architectural aesthetic requirements and should not require fencing, unless it is a larger area wide solution. Bioswales and infiltration areas in community areas should not be designed with greater than 1' depth.

Bioswales in conjunction with infiltration ponds: Infiltration ponds should have a infiltrating top soil. Existing material and foliage is best to use and should be the first option when calculating infiltration rate. The use of gravel only bottoms for infiltration should be minimized and limited to industrial areas.

Multi-use areas like parks, sports, and landscaping should be analyzed for detention and infiltration purposes. If they will not be utilized in the rain, it is a candidate for storm water management.

Overflow mechanisms such as adjoining berms in stepped infiltration/retention trenches or engineered overflow pipes based on storm events going to collection systems are allowed and encouraged. These are what allow management to utilize both available on-site measures and larger collection systems.

Rain Gardens/Car Parks. Use of approved shrubs and trees that are drought resistant should be used. Proper soil/mulch depths must be applied. The use of bark is discouraged for the reason that it may clog the storm drain that may be used for overflow. When no storm structures are present bark may be used. For sheet runoff, all parking islands should have curbs with cut-outs to allow water into the rain gardens.

Pervious Pavement/concrete. Proper installation is imperative for optimal infiltration. All hardstand areas must consider pervious pavement/concrete with the exception of high traffic areas and maintenance facilities.

Storage Tank or Cistern. Collected stormwater may be used for vehicle washing, irrigation or routed to purple pipe.

6.3.3.2. Erosion and Sediment Control. Provide appropriate erosion and sediment controls on all construction sites that will have ground disturbance. Proper implementation and maintenance of appropriate best management practices (BMPs) is critical to control any adverse water quality impacts from construction activities adequately. Discharges must not violate the state's surface water quality standards (WAC Chapter 173-201A) and groundwater quality standards (WAC Chapter 173-200).

(a) Volume II, Chapter 4 of the Ecology stormwater manual provides standards and specifications for BMPs that are approved for use on JBLM. Consider other BMPs with proper review and approval by JBLM PW.

(b) Preparation of a site-specific SWPPP is required for all construction activities that will have a land disturbance of one or more acres (or are part of a common plan of development that will disturb an acre or greater). Multiple construction sites under one contract must have an SWPPP prepared if the total land disturbance for all sites is greater than one acre.

(c) Construction sites that will have a land disturbance of one or more acres (or are part of a common plan of development that will disturb an acre or greater) or projects that have multiple construction sites under one contract if the total land disturbance for all sites is greater than one acre, must be covered under the EPA's NPDES CGP (Construction General Permit). See Permit Section 6.16 for details.

6.3.3.3. Vehicular Circulation.

(a) Parking Lot(s). The Contractor will be responsible for parking lots for the facilities. POV parking requirements are shown in the Drawings. All POV parking lots shall meet car park standards per the Master Plan. All roadways, driveways and parking lots shall have curb and gutter.

(b) Fire Department (Emergency) Vehicle Access

1. All buildings greater than 5,000 square feet, or more than two stories in height, must have at least one means of all-weather ground access to allow emergency vehicles unimpeded access to the building. Pave all-weather ground access with concrete, asphalt concrete or pavers. Start from the road, and terminate no further than 33 feet from building.
2. Provide residential facilities with all-weather ground access to three sides, with a minimum of two sides having access to sleeping rooms.
3. Provide new facilities four stories or more in height and all new warehouses with suitable all-weather ground access surface for aerial apparatus on a minimum of two sides of the perimeter of the structure.
4. For facilities with fire department connections for sprinkler or standpipe systems provide suitable all-weather ground access surface for pumper apparatus within 150 feet of fire department connections.
5. Provide a minimum width of 20 feet for vehicle access.
6. 100 Ft Aerial Ladder Truck Access:

GVW: 75,500LBS

STABILIZERS: Two (2) sets of extendible, out and down, "H" type stabilizers for stability. The stabilizers will have a spread of 18 feet.

FRONT AXLE: The front axle will be a reverse "I" beam type with inclined king pins. It will be a Meritor™ axle, Model FL-943, with a rated capacity of 21,500 pounds. The turning angle will be 39 degrees to the right and 45 degrees to the left.

WHEELBASE: The wheelbase of the vehicle will be 254".

Ladder truck required for structures with an eve height or top of parapet, 33 feet or more in height.

- a. Provide 28 feet of access parallel and adjacent to the longest side of the structure.
 - b. Provide required ladder truck access from the public street to the structure and return back to the public street. All turns associated with ladder truck access shall provide for minimum turning radii of 32 feet on the centerline.
 - c. Place the required ladder truck access a minimum distance of 5 feet from the exterior wall, including projections. Additional distance may be required due to ladder climbing angle and the hazard of falling debris from upper stories.
7. Padlock and key bollards, chains or painted curbs used to control fire department access to accept JBLM master key Best 750.
 8. Do not place obstructions near fire hydrants, fire department inlet connections, or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately visible and accessible. REF: National Fire Protection Act (NFPA) 1, Section 13.1.3.
 9. Maintain a minimum 36 inches (914mm) of clear space to permit access to and operation of fire protection equipment, fire department inlet connections, and fire protection system control valves. Do not deter or hinder fire department from gaining immediate access to fire protection equipment. REF: NFPA 1, Section 13.1.4.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

6.4.1.1. See the Drawings for topographic survey, demolition plan, site layout plan, site utility plan, and site grading plan drawings. Information shown is approximate. A three dimensional digital topographic file is included as part of this RFP. Obtain corrected survey data from any subsequent changes from the time the survey information was obtained to the present. Field verify surface and utility elevations. Use NAVD 88 datum for the vertical datum on all design and as-built submittals and verify that all information relied on for design utilizes NAVD 1988 vertical datum unless otherwise approved by JBLM PW. Locate all horizontal project information utilizing no fewer than two existing monuments tied into state plane coordinates. Provide new, permanent monumentation at all street

intersections and section line intersections and provide USACE with state plane coordinates using NAD83 datum (horizontal) and elevation using NAVD 1988 on all installed monuments. Geospatial data files are available from JBLM PW. Bring any discrepancies which are found in the furnished survey to the immediate attention of the Government for clarification..

6.4.1.2. Site Grading: Provide site grading to facilitate drainage and provide functional building, parking, and laydown areas. Site grading includes clearing and grubbing for access drives, parking lots, and any site development. Protect and preserve mature trees shown on the plans. Provide all foundation, subbase, and building floor slabs, including final grading material and compaction.

6.4.2. Existing Geotechnical conditions: See Appendix A for a preliminary geotechnical report.

6.4.3. Fire Flow Tests See Appendix D for results of fire flow tests to use for proposal purposes in estimating the basis of design for fire flow and domestic water supply requirements and for preparing the proposal cost estimate. Historical tests are not meant for design purposes. After award, coordinate with the Contracting Officer and JBLM Public Works to perform flow tests on the water system at the anticipated points of connection in order to provide up-to-date flow information during the design phase. Contractor shall also utilize sufficient factors of safety during design to account for fluctuation in water flow experienced at JBLM. If actual conditions vary sufficiently from those provided in Appendix D, which are the cause of a change in the design, an equitable adjustment (credit or increase, as appropriate) will be provided pursuant to the contract Changes clause.

6.4.4. Pavement Engineering and Traffic Estimates:

The Contractor shall be responsible for all roadway improvements and parking lots for the facilities, as shown on the drawings. Design procedures and materials shall conform to the applicable criteria. Provide on-street parking, continuous sidewalks, with pedestrian bulb-outs at intersections and planting strips along all streets as required by the Master Plan.

The Warehouse site will be developed with paved and crushed rock areas for use as container storage, parking and maneuvering. Refer to the drawings in Appendix J for further detail. An asphalt paved access driveway will extend from the new road along the east side of the site and wrap around the north end of the warehouse. Pedestrian traffic should be dedicated pathways to avoid conflicts with delivery and transport vehicles. Final building configuration will inform this design element. All pavements will be designed to minimize risk of frost damage. Pavement design considerations:

(a) Loading Dock area shall be concrete paved with final section per Contractor's geotechnical engineer's recommendations.

(b) Access Roadways shall be asphalt paved with final section per Contractor's geotechnical engineer's recommendations. Provide for a 25 year life expectancy under minimal maintenance.

(c) Internal circulation roadways shall be asphalt paved with final section per Contractor's geotechnical engineer's recommendations.

(d) Container Storage Area shall be paved with crushed rock with final section per Contractor's geotechnical engineer's recommendations.

(e) All proposed pavement sections and supporting documentation shall be submitted for JBLM review and approval prior to design acceptance.

6.4.5. Traffic Signage and Pavement Markings: Provide marked bike lanes on all roads per locations identified on the Master Plan. Provide pavement marking paints conforming to the most current version of Federal Specification TT-P-1952 unless otherwise authorized in writing by the JBLM Pollution Prevention Program.

6.4.6. Base Utility Information

6.4.6.1. General Utilities: Provide tracer wire directly above non-metallic lines and install marking tape. Exercise care when excavating trenches in the vicinity of trees. Where roots are 4-inches in diameter or greater, excavate the trench by hand and tunnel. When large roots are exposed, wrap them with moist heavy burlap for protection and to prevent drying. Hand trim sides of trenches dug by machines adjacent to trees having roots less than 4-inches in diameter, making a clean cut of the roots. Backfill trenches having exposed tree roots within 24 hours unless adequately protected by moist burlap or canvas. Exercise care to avoid compacting and polluting the soil in the root zone of trees to remain. Exercise care to minimize damage to tree trunks and branches by installing a temporary fence around each tree at its drip line.

(a) Provide meters with equipment to connect to DDC/BAS/UMCS capabilities for monitoring utility use and leak detection by JBLM. Hardwire the meter connections to the DDC/BAS/USMC to the DDC system; the wireless type (called out in Paragraph 5) is not acceptable.

(b) Electrical Service Maps: JBLM Public Works, Exterior Electric Shop owns and operates the electrical distribution system. Point of Contact: Mr. Jose L Solis, Electrical System Manager Engineer, 253-966-0143; and Mr. Ron Cottrill, 253-967-5840.

(c) Telecommunications: The National Enterprise Center (NEC), operates the Army communications system at Fort Lewis. Point of Contact: Mr. Gary Schroeder; 253-967-3870 or the MCA Info Tech PM Specialist, Mr. Michael C. Pope, 253.966.2828.

(d) Security: Coordinate physical security requirements through JBLM Physical Security. Point of Contact: Mr. Criss Christian, 253-966-7153.

(e) Cable TV Service: Comcast provides Cable TV service. Point of Contact: Mr. Terry Britton, Engineering Construction Coordinator, Comcast Cable, 410 Valley Avenue NW, Building C, Puyallup, WA 98371, 253-864-4293. Coordinate with Comcast during the design process.

(f) Qwest provides local telephone service at JBLM. Point of Contact: Ms. Leslie Ferguson, Senior Design Engineer, Qwest Communications, 2410 South 84th Street, Suite 18, Lakewood, WA 98499, 253-597-4033. Coordinate with Qwest during the design process.

(g) Exterior Utility Installation: Install utilities prior to paving, where new utilities cross roads, driveways, and parking lots to be paved under this contract,

(h) Install utilities beneath existing streets, using jacking or boring, as identified on the drawings unless otherwise approved. If open cutting of streets is shown on the drawings or approved, provide a minimum patch width of 15 feet of new pavement..

6.4.6.2. Sanitary Sewer Service

(a) General: To demonstrate the integrity of the installed material and construction procedures, the Contractor shall conduct final air testing after installation and prior to paving, . Allowable pressure drop shall be as given in ASTM C 924. Make calculations in accordance with the appendix to ASTM C 924. For PVC pipe, the testing shall be in accordance with UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the appendix to UBPPA UNI-B-6. For ductile iron pipe, the testing shall be in accordance with the applicable requirements of ASTM C 924. The Contractor may be required to retest the system if warranted by the contracting agency. Once the sub-grading is accomplished, all other underground utilities have been installed, the lines have been flushed, cleaned, and air-tested, and the site is ready to be paved, TV system to test for deflection and bellying. The Contractor shall remediate any problem areas to the satisfaction of JBLM PW prior to site paving.

(b) Prior to final inspection, test, flush, clean, and remove all debris from all pipelines. Flush a pipeline "cleaning ball" of the proper diameter for each size of pipe through all pipelines prior to final inspection.

(c) Before sewer lines are accepted, conduct a closed-circuit television inspection, using color video equipment with pan-and-tilt capabilities of the sewer pipe and appurtenances in the presence of the Contracting Officer, and provide two copies of the video media to the Contracting Officer.

(d) Not Used

(e) Install a boot/equipment wash system, adjacent to a building entrance/exit door. Discharge the boot wash system to the sanitary sewer system. Site it to minimize rain intrusion, and install an adequate oil/water/grit separator system to prevent direct discharge of non-sanitary waste into the collection system.

6.4.6.3. Water Service

(a) **General:** Provide material for and install water system for domestic use and to provide required hydrant flow to meet NFPA 24, NFPA13 and UFC 3-230-02 Operation and Maintenance Water Supply Systems. NFPA 13 requires clearances around the main riser to prevent damage of piping subjected to earthquakes. Provide fire lines of cement-lined, Class 52 ductile-iron pipe water main pipe. For water services other than fire lines, provide PVC C900 or Class 52 DIP. Provide water service appurtenances as required. Do not install utilities under the footprint of a building, other than the building they are designed to serve. Supply a fire-line off the domestic water main with PIV with tamper switch per NFPA 24 standards to supply the building's interior fire suppression system. Terminate fire line(s) at 5 feet from footprint of building. Install the fire riser from 5 feet outside the footprint of the building, including the 90-degree bend and flange. Tap each water service directly from the main serving the building. Fire lines and potable lines shall not share a dead-end main extension.

(b) Pressure test all tapping sleeves and tapping valves prior to making connection to existing mains.

(c) If backflow prevention devices are required for installation on the distribution system, add the following references to the specifications.

- American Water Works Association (AWWA)
- Cross Connection Control Manual (latest edition)
- Cross Connection Control Committee, Pacific Northwest Selection
- WAC 246-290-490, Cross Connection Control

(1) Backflow prevention assemblies shall be approved by the Washington State Department of Health (DOH) for installation in Washington. The most current list of approved assemblies is available from the DOH test reports, showing the name of the manufacturer of the BPA, the manufacturer's serial number, test date, test results, tester's name, and tester's certificate number.

(2) Reduced pressure principle assemblies, double-check valve assemblies, atmospheric (nonpressure) type vacuum breakers, and pressure-type vacuum breakers shall be tested, approved, and listed in accordance with FCCHR-01 and in accordance with DOH standards. Backflow preventers with intermediate atmospheric vent shall conform to ASSE 1012. Reduced pressure principle backflow preventers shall conform to ASSE 1013. Hose connection vacuum breakers shall conform to ASSE 1011. Pipe applied atmospheric-type vacuum breakers shall conform to ASSE 1001. Air gaps in plumbing systems shall conform to ASME A112.1.2. Backflow devices must be approved by DOH for installation in Washington .

(3) All testable backflow prevention assemblies (reduced pressure backflow assembly, double-check valve assembly, and pressure vacuum breaker) shall be tested and a test report form shall be completed, and submitted to the Contracting Officer (to be forwarded to the installation water systems manager). Test procedures and criteria shall be in conformance with recommendations published in AWWA Cross Connection Control Manual, Section 6, Requirements for Equipment Approval and Testing. Fittings in areas shown on the plans for restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1.

(d) Install hydrants with 6-inch shutoff gate valves for easy maintenance and service. Fit fire hydrants with 5-inch Stortz adapters. Provide hydrants in accordance with UFC 3-600-01 and NFPA 24. At least one hydrant shall be located within 150 feet of the fire department connection. Locate hydrants at least 40 feet from the building to be protected. Where hydrants cannot be located at least 40 feet from the building, locations closer than 40 feet from the building or wall hydrants shall be permitted to be used where approved by the authority having jurisdiction. Locate hydrants between three to seven feet from a paved traffic rated surface. Do not locate hydrants closer than 10 feet to any obstruction or near an entranceway. Install the 5 inch suction connection perpendicular to the nearest roadway. As required, provide protection for fire department connections (FDCs) from vehicular damage.

(e) The flow tests were conducted in the vicinity of the project sites and can be found in Appendix D. Any additional flow testing shall be the responsibility of the Contractor for the Contractor's portion of the development activity. Conduct any additional water flow testing in accordance with NFPA 291, Recommended Practice for Fire-Flow Testing and Marking of Hydrants. Collar the hydrant barrel with one reflective metal backed collars and

number to provide pumper operators with an indication of available flow. Classify hydrants in accordance with their rated capacities (at 20 psi residual pressure or other designated value:

Class AA – Light blue - rated capacity of 1,500 gpm or greater (5,680 L/min)

Class A – Green - rated capacity of 1,000 to 1,499 gpm (3,785 to 5,675 L/min)

Class B – Orange – rated capacity of 500 to 999 gpm (1,900 to 3,780 L/min)

Class C – Red – rated capacity of less than 500 gpm (1,900 L/min)

(f) Paint hydrant barrels red for non-potable water/Color Code 11120 and Chrome Yellow for potable water/Color Code 135916.

(g) If not already in place, secure a blue double-sided reflectorized raised pavement marker in the road and organizational parking areas near center line for each hydrant. In addition to collaring, install a metal tag on each hydrant that indicates the hydrant number, with the Global Positioning System (GPS) location. Establish a GPS location for each fire hydrant. This tag will provide a secondary indicator to operator should the marking be removed. Submit hydrant test and installation report to the Contracting Officer (to be forwarded to the installation water systems manager).

(h) All water meters shall be read in US gallons, have frost protection design, have bronze casing and have permanently sealed registers. Register type shall be an encoder-type remote register designed in accordance with AWWA C707. Supply and install all domestic water meters needed for each project site. Provide water meter with equipment to connect to DDC/BAS/UMCS system for monitoring by JBLM

(i) Meter boxes shall be concrete with cast-iron lid and cast-iron meter reader lid. Use plastic boxes and lids only in unpaved areas or grass areas not subject to vehicular traffic.

(j) Demolition of existing water utility systems requires a cut and cap plan to be submitted for approval to JBLM PW Business Operations Integration Division (BOID). This is a prerequisite for any utility outage work requests needed in support of the demolition work

(k) PW shop support with turn-offs: Notify and schedule with all affected water customers for utility outages. Water system valve work on the operational utility system is restricted to Government personnel only. Contact JBLM PW Utility Division no later than 15 business days prior to the date of outage to schedule support for turnoffs.

(l) All new water system connections require a water connection permit completed prior to receiving an authorized connection date. Permits are available from the JBLM PW Environmental Division. As part of the permitting process, the Contractor shall be prepared to present flushing, chlorination, and bacteriological testing procedures with JBLM Water Plant personnel (253-967-2527) and the Water Systems Manager with PW BOID. Approved designs are required prior to receiving a connection permit. Modifications prior to connection require additional permit coordination.

(m) Hydrants for construction work and backflow preventers: Coordinate with PW BOID if hydrant water is needed during construction (including filling trucks). The Contractor will be assigned a hydrant, but the Contractor shall supply an approved backflow device and have it tested installed. If it is removed and reinstalled, it must be retested.

6.4.6.4. GAS SERVICE

(a) General: Puget Sound Energy (PSE), 888-321-7779, owns and operates the gas distribution system on JBLM. Therefore, local utility standards as determined by PSE for installation of natural gas facilities shall take precedence over any references made in this document to natural gas facilities installation methods, means, and materials. Provide all meters with a pulse meter sensor compatible with the JBLM DDC/BAS/UMCS system for monitoring. Coordinate and contract with PSE for the installation of the natural gas piping up to and including the meter to all facilities at their respective sites. Include the PSE's installation cost, including meter, in the contract price. Provide the meter with equipment to connect to DDC/BAS/UMCS system for monitoring. See Appendix C for exhibit representing the location of the existing natural gas main.

(b) Gas Line Locations: Anticipated gas line locations are identified in Appendix C of this RFP. Provide protection for gas meters from vehicular damage.

(c) Propane Fuel Distribution System: JBLM owns and operates the propane-air fuel distribution system. Install the propane facilities with a minimum separation of 36 inches from PSE's natural gas pipe. Connect piping downstream of the building's natural gas meter to the back of sidewalk along the street and cap piping so that connections can be made in the future to the propane-air distribution system. Pipe installers shall be qualified

under 49 CFR 192 and submit copies of certification for government approval. Coordinate with utility provider to identify the required color of pipe to distinguish the two facilities.

(d) Utility Pads: Install all concrete utility pads located outside the building exterior for any mechanical or utility device needed for the building operation and function. Include all necessary piping, wiring, or utility extensions for the device to function as designed. Locate mechanical equipment adjacent to existing or proposed sidewalks (other than sidewalks along public roads). Screen mechanical units on a minimum of three sides. Screening shall consist of landscaping that, when mature, will hide equipment from view or with masonry or other prefinished decorative screen walls consistent with the appearance of the building. Wood fencing, metal siding, or chain link fencing with privacy slats are not acceptable. All utility pads with equipment shall meet antiterrorism/force protection standards.

6.4.7. Cut and Fill

Cut and fill should equal out where possible.

6.4.8. Borrow Material

6.4.8.1. Contractor is authorized to remove and use previously excavated soils stockpiled in the JBLM borrow source pits for JBLM projects only, per the requirements below. Material excavation and removal is not authorized without written approval from the contracting officer. Obtain mined material from licensed and permitted sources off government property. If seeking to utilize borrow pits on JBLM:

- (a) Contact the JBLM Solid Waste and Recycling Program Manager for borrow pit use and activity authorization (253-966-6452).
- (b) Submit a completed JBLM Borrow Source Entry Notification form for the acceptance or removal of soil from borrow source pit. Submit to the JBLM Solid Waste and Recycling Program Manager (253-966-6452) for review and approval. Obtain approval prior to the deposit or removal of any soil from a borrow source pit on JBLM.
- (c) Perform proctor tests on borrow material in accordance with ASTM D 1557.
- (d) Secure training area/range accessibility through the JBLM Directorate of Plans, Training, Mobilization, and Security (DPTMS), Range Control (253-966-5060).
- (e) Secure an installation digging permit (see Appendix S of JBLM Regulation 200-1).
- (f) Return location to same or better condition after operations (smooth contours, remove trash, grade steep slopes).
- (g) Before use of borrow pits on JBLM YTC, activation must be coordinated through PW (Building 810, 509-577-3400) and PW Environmental Division (ED) (Building 810, 509-577-3545), and occur prior to use of the site.

6.4.8.2. Contractor may alternately obtain mined material from licensed and permitted sources off government property.

6.4.8.3. See 6.17.2 for disposal of material.

6.4.9. Haul Routes and Staging Areas

Adhere to the haul route and laydown areas as directed by the Contracting Officer. Laydown areas are shown on drawings in Appendix C. Restore the laydown areas to their original condition after construction is complete.

6.4.10. Clearing and Grubbing:

(a) Clear and grub all trees and vegetation as shown on plans for construction, but save as many healthy trees as possible. Consider alternatives of the site orientation to preserve existing trees. Unless otherwise noted, hire a qualified tree specialist (International Society of Arboriculture (ISA) certified arborist, urban forester, or horticulturist) to determine the health and safety of trees. Remove any hazardous trees as determined by the tree specialist. Protect trees within the project site limits by a fence around a tree directly under its outermost branch tips. Crown-prune existing trees to be preserved to remove all dead, broken, or crossing branches within the crown of the tree. Accomplish pruning by trained and experienced personnel in accordance with ANSI A300. Remove all flagging, paint, hardware, or other man-made products from trees to remain prior to completion of landscaping. Replace any

existing vegetation designated to remain that is damaged during the work under this contract in kind with a minimum 5 feet high, in accordance with Section 01 57 20.00 10, Environmental Protection.

(b) All timber removed from the project shall remain the property of the Government, unless otherwise indicated or specified. Pile merchantable trees in a neat, limb-free deck for subsequent disposal by the Government. Pile coniferous tree stems separately from deciduous tree stems. A merchantable tree is defined as a tree with a small end diameter of at least 4 inches and 16 feet in length. Cut trees from the stump and limb (flush to the trunk) out to a 4-inch diameter. Top trees at 4-inch diameter and from this point to the top of the tree shall be considered non-merchantable (slash). Whenever possible, do not cut trees into log lengths. If trees are too large to be handled at full length, cut 41-foot logs from the butt end until a manageable length is achieved. Pile tree length logs separately from all shorter material (cut and broken logs). Locate piles as directed by JBLM and Forestry office. Locate piles so as not to interfere with construction work and so they will be accessible at a later date for disposal action. Piles shall be stable and not exceed 8 feet in height.

(c) To maintain the highest potential cost recovery to the Government, fell and buck trees into preferred lengths prior to removing them from the site for storage. Preferred lengths are as follows: 41 feet-10 inches, 38 feet 10 inches; 36 feet 10 inches; or 32 feet 10 inches. Acceptable lengths include 2-foot multiples less than 32 feet-10 inches down to 16 feet-10 inches. Merchandise all logs down to a 4-inch top. Merchandise log lengths to exclude volume defects.

(d) Remove material and soils to be stripped or grubbed to a depth recommended by the Contractor's geotechnical engineer. Remove tree stumps by grinding to a minimum depth of 18 inches below designed subgrade surface or original ground surface, whichever is lower. If the stump is within the dripline of a tree to be preserved, grind the tree stump to designed subgrade level only. Fill depressions made by grubbing with satisfactory soil unless further excavation or earthwork is necessary. Restore damaged areas not scheduled for clearing/grubbing to their original condition, as acceptable to Contracting Officer. Leave the work site in a clean and slightly condition, free from litter and debris.

6.4.11. Landscaping:

The Contractor is responsible for the landscaping in accordance with UFGS 32 93 00 Exterior Plants within the project construction limits

6.4.11.1. Tree Preservation Plan: Protect and preserve trees noted on the drawings. Provide a Tree Preservation and Protection Plan to the Contracting Officer for approval before any clearing and grading can take place. The Plan shall conform to JBLM's Urban Forest Management requirements included in Appendix AA.

6.4.11.2. Preserve Oregon White Oak trees (*Quercus garryana*) that have a diameter of 6 inches or greater. Replace oak trees that cannot be preserved at the ratio of six new Oregon White Oaks for every one removed. In accordance with the attachment entitled "Attachment for Joint Base Lewis-McChord Oregon White Oak Planting Plan" included in Appendix AB. Contact the Contracting Officer for guidance on locations for planting new oak trees.

6.4.11.3. Existing Plant Materials: Make every effort to preserve and protect existing plant materials, particularly mature trees, as shown on the drawings. Protect the root zone and foliage of materials being retained with temporary fencing. Install temporary fencing as indicated on plans or outside the drip line of trees or plant materials to retain. Where trees and other vegetation must be cleared from a site, mark trees and confirm planned clearing with the Contracting Officer prior to cutting.

6.4.11.4. New Plant Materials: Use only drought tolerant and insect and disease resistant species native to and/or adapted to western Washington. Review Appendix I for lists of acceptable and prohibited plant materials. Provide trees, shrubs, groundcovers and grasses consistent with existing plantings. Minimize the use of turf areas except at required parade and marching areas. Provide soil amendments and fertilizers to ensure successful plant establishment. New plant materials shall meet the following criteria.

- (a) Able to withstand weather extremes likely to occur in any 10-year period without supplemental irrigation or seasonal protection.
- (b) Acclimated to western Washington for a period of one growing season.
- (c) Low-maintenance varieties without significant pruning and thinning requirements.
- (d) Plant trees and shrubs in locations that will avoid contact with buildings, lighting and utilities when mature.

(e) Shrub beds, street plants, and similar features shall be suited for stormwater runoff management whenever possible. Use the most current version of the *Low Impact Development Technical Guidance Manual for Puget Sound* or similar low impact development (LID) manual for design and specifications.

(f) Tree planting: Excavate planting holes, with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Make excavations at least 2 times wider than rootball spread. Set top of root ball slightly higher than surrounding finish grade. Planting backfill soil mix shall be as follows: 1/4 compost material, 1/4 topsoil and 1/2 soil excavated from planting pit. Stake/guy trees and form watering basin in topsoil around tree. Provide 6 foot diameter mulch ring and base of tree.

(g) Plant sizes and conditions in accordance with the latest edition of ANSI Z60.1 American Standards for Nursery Stock. Minimum plant sizes are as follows:

1. Deciduous trees: 2-inch caliper
2. Coniferous trees: 6 to 8 feet tall
3. Large shrubs: 3-5 gallon containers
4. Small shrubs: 1-3 gallon containers
5. Perennials and ornamental grasses: 1 gallon container
6. Groundcovers: 1 gallon container
7. Wetland/herbaceous plants: 10 inch tube plug

6.4.11.5. Warranty. Guarantee furnished plant material to be in a vigorous growing condition for a period of 24 months regardless of the contract time period. Replace a plant one time under this guarantee. Transplanting existing plants requires no guarantee.

6.4.11.6. Landscape Design: Provide landscaping schemes that are consistent with the function of the facility, contextually compatible with existing landscape design in the vicinity, and in accord with the sustainable design goals of the project. Provide continuity with existing landscapes, including continuation of adjacent lawns, shrub beds, street tree plantings, and similar features. Provide landscaping over all site areas not covered with buildings, pavement, or other non-vegetative surfacing. Landscape design should provide a professional and natural appearance to all sites while minimizing water consumption and the amount of recurring labor necessary for maintenance. Design shall incorporate the following.

- (a) Conformance with antiterrorism design standards.
- (b) Screening of parking, service areas, and utility equipment from adjacent streets.
- (c) Landforms and practices consistent with minimization of erosion.
- (d) Edging strips to separate lawn areas from shrub beds and 2-foot gravel beds at foundations of buildings.
- (e) Mulch at all tree plantings, shrub and ground cover beds.
- (f) Street and parking lot trees as required by the Master Plan
- (g) Consider Sight Vision Clearance and Sight Distance near intersections. Landscaping shall not obstruct vision or hinder the safety of motorists at intersections and driveways.
- (h) Consider Utilities. Consider overhead power lines or underground utilities.
- (i) Consider drainage. Landscape features shall not obstruct drainage or cause undesirable drainage issues.

6.4.11.7. Irrigation Systems: Use potable water to provide temporary irrigation necessary to maintain plant materials until established. Disconnect temporary irrigation systems used for plant establishment from potable water sources within 18 months of installation. Where captured rainwater, recycled wastewater, recycled greywater, or water treated and conveyed by public agency specifically for non-potable uses is available, permanent irrigation systems are acceptable. No permanent potable water irrigation systems are permitted. Where non-potable systems are used, irrigation system components shall be color-coded purple for reclaimed water.

(a) Irrigation control shall be automatic, easily programmable for weekly adjustment, and capable of providing separate frequency, time and duration settings for each zone. Locate all controllers in facility electrical rooms in a common wall area. Do not locate irrigation equipment within turf areas to receive foot traffic. Prevent contamination of potable water by irrigation water.

(b) Design irrigation systems to minimize the risk of damage from freezing. Provide connections at the head end of systems to accommodate seasonal evacuation of water using air pressure. Provide manual drain valves to gravel basins as required for drainage.

(c) Underground irrigation piping shall be PVC Schedule 40 plastic pipe or polyethylene plastic pipe for drip systems. Sleeve all pipes when crossing hard surfaces or where there is vehicular traffic. Sleeve material shall be PVC Schedule 40 for walk or drive crossings for light to medium weight vehicles and Schedule 80 for heavy truck or tank crossings. Use overhead spray (gear, rotor or rotator) heads at lawn areas and drip emitters, integral dripper lines or overhead spray heads at tree, shrub, and groundcover beds. Drip irrigation may also be considered in conformance with paragraph 6.4.11.7.

(d) Irrigation Capacity: Sufficient to establish landscape plantings with maximum contribution by precipitation equal to the Precipitation Allowance.

1. Precipitation Allowance: 25 percent of normal rainfall, maximum, in any month.

2. Application Rate: On average, apply 1 inch of water per week during establishment period..

3. Irrigation Efficiency: 62.5 percent minimum for overhead irrigation and 92.5 percent minimum for drip or other low volume systems, of applied water actually reaching plants, under normal climatic conditions.

4. Locations of Irrigation Equipment: To provide complete coverage of landscaped area requiring irrigation, without excessive overspray or runoff onto pavements, buildings, or un-irrigated planted areas.

5. Variation in Application Rate at Individual Locations: Head to head coverage or point source distribution varying not more than 25 percent. Use pressure compensating devices to ensure uniform output

6. (Sloped Areas: Prevent drainage out of lower outlets. Adjust programming to avoid runoff.

(e) Irrigation plans and specifications shall identify the materials to be used and the construction methods.

(f) Irrigation plans and specifications shall consider the soil type, slope, and other site characteristics to minimize water waste.

(g) Design the system to minimize free flow conditions in the event of main line damage or other mechanical failures.

(h) The irrigation plans and specifications shall require the system installer to conduct final system testing and adjustments to achieve design specifications prior to final acceptance of the system.

(i) Provide post construction documentation (as-built drawings) and recommended maintenance activities and schedules. Provide the operation schedule, designed precipitation rates, water shut off methods, operational guide for irrigation equipment installed, and any adjustment keys or tools.

6.4.11.8. Water Conservation: All landscape design shall incorporate water conservation consistent with JBLM regulation 11-5 for reduction of water consumption. Provide design consistent with the following:

(a) Use potable water to provide temporary irrigation necessary to maintain plant materials until established .

(b) Coordinate irrigation design with plant selection requirements..

(c) Minimize water usage through appropriate plant selection, soil amendment, efficient irrigation, and mulching.

(d) Provide irrigation for street trees on separate drip irrigation valved sections from lawn areas.

(e) Irrigate plants in hydrozones grouped by different water needs for ease of water application..

(f) Calculate a landscape design's total estimated water use by determining the estimated water use for each hydrozone and adding the estimated water use for all hydrozones together. The sum of all hydrozones is the landscape's total estimated water use. Indicate water use on irrigation plans.

(g) The evapotranspiration rate for the Puget Sound lowlands region is 14.49 inches per irrigation season.

(h) Average hydrozone based on relative areas of each, using plant factors as follows::

(1) Native Plants: Defined as plants that grow in the wild in natural local climate, or other plants and turf of equivalent climatic endurance requiring no supplementary irrigation; plant factor of 0 (zero).

(2) Low Water-Using Plants: Plants proven to be able to survive significant periods without water in the local climate without degradation of appearance; 0.0 to 0.3.

- (3) Moderate Water-Using Plants: Plants proven to be able to survive periods without water in the local climate but with significant degradation of appearance; 0.4 to 0.6.
- (4) High water use plants, including flowering plants when in flower: 0.7 to 1.0.
- (5) Moderate Water-Using Plants: Plants proven to be able to survive periods without water in the local climate but with significant degradation of appearance; 0.8.
- (6) Flowering Plants, when in Flower: 1.20.
- (7) Area within Drip Line of Trees: 1.0; regardless of other type of planting.
- (8) All irrigated turf grass: 1.0
- (i) Irrigation Efficiency Value: Conventional overhead spray irrigation = 0.625, drip and other low volume irrigation systems = 0.925.

6.4.11.9. Topsoil: Provide topsoil, whether native from the site or imported, for landscaped areas meeting ASTM D 5268; natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles, conforming to USDA classification for Loam or Sandy Loam; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 3/4 inches in any dimension; and free of weeds, roots, and other deleterious materials. Topsoil shall meet the following requirements:

- (a) Topsoil textural particle composition requirements, percentage by mass:
 - 1. Sand (0.05mm to 2.0mm) 30% to 50% of total
 - 2. Silt (0.002mm to 0.05mm) 30% to 50% of total
 - 3. Clay (Less than 0.0023mm) 8% to 20% to total
 - 4. Gravel (Larger than 2.0mm) 5% maximum of total
 - 5. Organic material: 6% to 20% of total
- (b) Saturation extract concentration for boron: less than 1.0.
- (c) PH range of from 6 to 8 (plus 0, minus 0.5).
- (d) . Saturation extract conductivity: less than 4.0 dS/m @ 25 degrees Celsius as determined in a saturation extract.
- (e) Non-soil components: less than 1 percent by volume
- (f) Heavy metal concentrations: below the Washington State Department of Agriculture (WDSA) year load limit.
- (g) Minimal weed seed.
- (h) Perform soil tests of native and imported topsoil to establish chemical, mechanical, and nutrient character. Amend the backfill topsoil mix for landscaped areas for improved plant growth and water holding capacity as indicated by the soil test. Provide sufficient topsoil material for landscape plant establishment, ease of maintenance requirements and longevity of successful landscape design. Provide minimum topsoil depth of 8 inches at all lawn and field grass areas. Provide minimum topsoil depth of 18 inches at all shrub and ground cover beds.

6.4.11.10. Mulch: Place mulch to a minimum depth of 3 inches. Provide standard commercially produced, medium-course, bright bark mulch. Bark shall be of uniform color, free from weeds, seed, sawdust, and splinters and shall not contain resin, tannin, or other compounds detrimental to plant life. All material shall pass a 1-inch mesh screen. Inorganic mulches may be used with Contracting Officer approval.

6.4.11.11. Apply hydromulch using the recommended rate of an organic tackifier. Hydromulch shall be free of weeds and promote germination and seedling establishment. Erosion control blankets shall be used whenever reclaiming slopes greater than 3:1 or along drainage areas where erosion is probable. Do not use bark as hydromulch.

6.4.12. Turf:

6.4.12.1. General: Provide turf areas only where indicated on the plans.

6.4.12.2. New Sod: All sod shall be locally grown and state-certified as classified by applicable state laws and industry standard. Provide soil amendments and fertilizers to ensure successful turf establishment. Establish and maintain a healthy stand of turf.

- (a) Provide sod free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 1 inch in diameter, woody plant roots, and other material detrimental to a healthy stand of turf.
- (b) Dry moldy, yellow, irregularly shaped, torn or uneven end sod pieces are not acceptable.
- (c) Sod shall be machine cut to a uniform thickness of 1 inch within a tolerance of 0.25 inch, excluding top growth and thatch.
- (d) Measurement for thickness does not include top growth and thatch.
- (e) Use sod anchors for sloped areas as recommended by the sod supplier.

6.4.12.3. Seed Mixes: Provide certificates for each grass seed mixture, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed. Certify that each container of seed delivered is fully labeled in accord with Federal Seed Act and equals or exceeds specification requirements. Deliver seed in standard sealed containers labeled with producer's name and seed analysis, and in accord with US Department of Agriculture Rules and Regulations under Federal Seed Act. Provide soil amendments and fertilizers to ensure successful seed establishment and to maintain a healthy stand..

- (a) Provide seed that does not contain mold or is otherwise damaged.
- (b) Provide seed that does not contain amounts of weed or crop seed greater than 1 percent by weight of the total mixture and free of restricted or prohibited noxious weed seed. Inert matter may not exceed 3 percent by weight of the total mixture.
- (c) Seed mix for general purpose seeding shall be composed of low growing perennial rye grass (approximately 70% by weight) and turf-type fescue grass (approximately 30% by weight) blends or three-way perennial rye grass blends as available from regional seed suppliers.
- (d) Water quality, wetland, and restoration seed mixes as available from regional seed suppliers if required. Ecology and meadow mixes may only be used with Contracting Officer approval prior to installation.
- (e) Seeding for non-irrigated turf areas shall take place in normal weather and temperatures that are appropriate and typical for such work between March 1 and April 15, and September 1 and October 15. Seeding on other dates or during adverse conditions is at the risk of the Contractor.
- (f) Sample the hydroseeding mix at the beginning of each application. Test each to ensure it meets the requirements of this section.

6.5. ARCHITECTURE

6.5.1. General: To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein . The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the contract or task order competition. The first priority in order of importance is that the design provides comparable building mass, size, height, and configuration compared to the architectural theme expressed herein. The second priority is that design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and installation material/color pallets, as described herein.

6.5.2. Design

6.5.2.1. Appendix F is provided "For Information Only", to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on JBLM's Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

6.5.2.2. The design should address JBLM's identified preferences. Implement these preferences considering the following:

- (a) Achievable within the Construction Contract Cost Limitation (CCL)
- (b) Meets Milestones within Maximum Performance Duration.
- (c) Achieves Full Scope identified in this Solicitation
- (d) Best Life-Cycle Cost Design
- (e) Meets the Specified Sustainable Design and LEED requirements.
- (f) Complies with Energy Conservation Requirements Specified in this RFP.

6.5.2.3. Priority #1. Visual Compatibility: Facility Massing (Size, Height, Spacing, Architectural Theme, etc.) Exterior Aesthetic Considerations: The buildings massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is:

6.5.2.4 DESIGN THEME

6.5.2.4.1 GENERAL: Provide facilities that are fundamentally sustainable, require minimum operation and maintenance inputs, reflect the military hierarchy of their occupants and blend harmoniously with the existing style and context of development in the Logistics Center neighborhood of Joint Base Lewis-McChord, except where existing adjacent buildings do not comply with this Area Design Guide (ADG). Facilities shall conform to the Joint Base Lewis-McChord Real Property Master Plan (RPMP). Architectural theme and requirements of the Logistics Center ADG for Industrial Facilities (i.e., Warehouse/TEMF) are included in this section as well as in the Building Photos Appendix.

6.5.2.4.2 ARCHITECTURAL STYLE: All Logistics Center area facilities shall be based on a "Contemporary Northwest" campus aesthetic, with underlying principles of proportion based on "Neo-Georgian" or "Neo-Federal" style referenced from the original garrison facilities located on Lewis Main.

(a) Stylistic features:

- Building proportioning and massing using the "golden section"
- Balanced, syncopated rhythm of fenestration and building elements (as illustrated in the Building Photos Appendix)
- Vestibule entrances with exterior covered areas
- Campus-like setting with buildings clustered and preservation of the maximum amount of trees on the forested site
- Building axes primarily east-west

(b) Roof:

- Stepped buildings with shed roof and clerestory forms used for daylighting
- Include overhangs on rake and eave ends
- Slope roofs in the range of 4 on 12 to 6 on 12 (5 on 12 preferred)

(c) Fenestration:

- Maximize natural light and ventilation in administration areas through the use of operable ribbon style windows or curtain walls

- Utilize translucent panels for overhead doors, transom and clerestory elements
- Windows shall be split into a daylighting portion and a view portion, with permanent interior and exterior architectural elements that prevent summer sun penetration to 90% of interior spaces, while allowing daylight and views
- Exterior sunshades shall not require periodic maintenance to retain appearance or effectiveness
- Window layouts and sizing shown on the standard design floor plans in other sections of this RFP are notional only. Contractor shall determine the type, size, proportion and placement of windows based on ADG requirements herein and the overall massing and layout of their particular design solution

(d) Materials:

- Masonry base to anchor the buildings to the site
- Complementary base and accent materials shall be stone, concrete or masonry
- Wall surfaces shall be brick masonry with complementary metal siding materials above (masonry height and metal siding profile to match adjacent facilities as illustrated in the Building Photos Appendix F)
- Standing seam metal roofing

(e) Exterior Colors: The color scheme is primarily natural materials in neutral earth tones. Refer to Appendix F.

6.5.2.4.3 COMPATIBILITY: Proposed facilities shall include architectural elements required by this area design guide and use the same color palettes as adjacent facilities as illustrated in the Building Photos Appendix. All facilities shall incorporate a unifying style and aesthetic for the Logistics Center neighborhood.

6.5.2.4.4 CONTEXT: See the Building Photos in Appendix F for an outline of exterior finishes and images of existing/future facilities in the Logistics Center neighborhood, in addition to illustrations that define required elements of the area design guide.

6.5.2.4. Priority #2. Architectural Compatibility: Exterior Design Elements (Materials, Style, Construction Details, etc.) Roofs, Exterior Skin, and Windows & Door Fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of building systems.

6.5.2.5. See Appendix F for exterior colors that apply to Architectural character. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.

6.5.2.6. Additional architectural requirements:

(a) Provide permanent fall protection anchors on all roofs in accordance with OSHA requirements for personal fall arrest systems. Provide access to low slope roof areas from the interior of the building, using permanent ladders, stairs, hatches and doors. Access to roofs shall be from mechanical rooms or secured by locking mechanisms on both the interior and exterior sides to prevent unauthorized access.

(b) Minimum roof slope for low slope roof systems is ¼ inch per foot and 4 inches per foot for steep slope roof systems. (5:12 preferred) Low Slope roof systems may only be used where required in other sections of the RFP. Avoid valleys and complex flashing and complex venting conditions.. Provide roofing installation and gutter design at valleys to prevent water overflowing or overshooting the gutter. Ensure that roof coverings do not restrict water flow at end of valley, and provide baffles, conductor heads and similar elements as needed. Where downspouts from higher roof areas drain onto lower roof areas, provide elbows and extensions to direct outflow away from wall and base flashing. Protect all exterior personnel doors from the weather. Minimum thickness of roofing materials shall be in accordance with standards listed in Paragraph 4, Applicable Criteria.

(c) Exterior Wall Mockups: Construct a 6 feet wide x6 feet high, full-size representation of the typical physical exterior wall assemblies, including trim and a sample of roofing material in the mock-up wall, that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and qualities of actual materials and execution, and to review construction, coordination, testing, or operation; they are

not samples. Approved mockups establish the standard by which the Work will be judged prior to selection of the final colors. Build mockup to verify selections made under sample submittals and to demonstrate aesthetic effects.

(d) Exterior Insulation and Finish Systems (EIFS), are not acceptable.

(e) Exposed exterior materials shall not require periodic repainting or refinishing. Materials shall have factory prefinished, integrally colored, or similarly intrinsic weathering finishes. Ferrous metals shall not be exposed to the weather unless prefinished with a protective coating that has a minimum 20-year warranty. Exterior metal siding panels or metal roofing shall not exhibit oil canning. Exterior masonry surfaces shall be provided with a penetrating, breathable masonry sealer.

(f) Exterior Doors: Entry doors into lobbies and corridors shall be glazed aluminum storefront entry systems. Protect all exterior personnel doors from the weather by recessing, roof overhangs, or canopies.

(g) Exterior Windows: Provide operable windows with insect screens for all occupied spaces, unless prohibited by security standards or other sections of the Solicitation. Provide power operators only for windows that are not within the normal reach range of personnel. Provide windows in sleeping room with manufacturer's standard hardware to allow window to be opened for venting while preventing access through the opening from the outside.

(h) Aesthetically integrate the design of alternative energy systems: Solar panels, photo-voltaic panels, wind turbines, and other elements designed to increase energy efficiency into the facility appearance so that they do not appear out of character with the building or as elements added after construction. For example, roof slopes shall align with panel orientation. Show equipment types, sizes, and locations on interim design submittal drawings.

(i) Provide an antenna mount on the roof of all administrative buildings (Company Operations Facilities, Battalion Headquarters and Brigade Headquarters), to include a sleeve for antenna mounting and eyebolts for guy wires secured to the building structure, and a pathway for cable. Coordinate location with Contracting Officer.

(j) Comply with provision applicable standards and with provision of the provisions of ASME 17.1 and with Washington Administrative Code (WAC) 296-96 Elevator Safety Regulations, including inspections and certifications. Coordinate with the Contracting Officer to ensure proper attendance by Elevator Inspector during construction, inspection, and testing periods. Verify all critical construction activities that must be witnessed by the inspector and do not proceed with that portion of the work until the inspector is present. Provide a sump pump for elevators provided with Firefighter's Emergency Operation. The sump pump shall have a capacity to remove a minimum of 3,000 gal/hr per elevator and shall route directly through an oil/water separator to sanitary or storm water sewer in accordance with discharge permits, regulations, and statutes.

6.5.3. Programmable Electronic Key Card Access Systems:

All locking systems shall comply with keyless entry standards. Only communication rooms, mechanical rooms, and electrical rooms shall have a keying lock system with interchangeable cores. Pushbutton actuators for ADA-accessible entrances shall have a keyed on/off switch on the interior side; the Coordinate the location with the Contracting Officer.

6.5.3.1. Key Changing: All locks shall be changeable without disassembly of lock cylinders; acceptable methods include interchangeable removable core cylinders.

6.5.3.2. Control of Lock Cores and Keying: Provide all hardware and construction (temporary) cores required to secure buildings, utility access, and related work throughout the construction period. Provide construction cores with a bright color on their exposed face for ease of identification. During construction, the Contractor shall meet with representatives of the Contracting Officer, PW Lock Shop, and the user to develop a keying schedule. Submit Schedule to Contracting Officer for approval. Provide final keying and combinations as performed by a licensed, bonded locksmith approved by the Contracting Officer. Upon acceptance of the facility for occupancy, replace construction cores with final cores in the presence of the government inspector and a PW locksmith, test each lock for proper operation and deliver any permanent or control keys to the inspector. Prior to core change out, provide the government, by security shipment, with keys tagged with identifying labels in the quantities indicated.

6.5.3.3. Authorized Locksmiths: The following locksmiths are currently approved by the JBLM PW Lock Shop to combine cores for locksets used in this project. Verify that authorization remains current prior to beginning lock/core related work on this project.

- (a) Bassett Services: POC: Bob Bassett, 2111 Hernlock Ct SE, Lacey, WA 98503 (360) 239-4416
- (b) PD Services Unlimited: POC: Pam Johnson, 9508 356th St. S., McKenna, WA 98558 (360) 359-0811
- (c) Security Unlimited: POC: Mike Pennella, 8205 E. Martin Way #188, Olympia, WA 98516 (360) 351-951-1774 (cell)

6.5.3.4. Cylinders and Cores: Provide cylinders and cores with six-pin tumblers for locks. Cylinders shall be products of one manufacturer, and cores shall be products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets shall have interchangeable cores that are compatible with A-2 standard (A-2 system specifications are available at <http://www.lab-lockpins.com/pinsicore.htm>) and that are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core. Cylinders shall be fully compatible with products of the Best Lock Corporation, Arrow Lock Corporation, or Falcon Lock. Submit a core code sheet with the cores. Provide cores master keyed in one system for this project. Provide construction interchangeable cores.

6.5.3.5. Keys: Furnish four keys for each lock core KD (keyed different), and four keys for each set KA (keyed alike) to the PW Lock Shop for control and issuing. In addition to the keys listed above, furnish four additional key blanks per core KA. Stamp each key with appropriate key control symbol and "U.S. Property – Do No Duplicate". Key bows must be stamped with key code line ID (example: LA1223, MPA1223, etc.). All JBLM codes are one to four letters and one to four numbers. Public Works Lock Shop will provide ID information and Master control number to be used in combining cores. Do not place room number on keys.

6.5.3.6. Programmable Pushbutton Locksets: Hardware shall be programmable pushbutton locksets OSI Omnilock "OM500" for all exterior entrance doors, including glazed doors in aluminum store front systems, and KABA "E-plex 5000" for all locking interior doors, except provide standard bored locksets on mechanical, electrical, and telephone rooms. For programmable locks, provide key override and interchangeable cores.

6.5.3.7. Mechanical, Electrical, and Communication Room Doors: Provide standard keyed locksets for these doors. Key mechanical/electrical equipment rooms and rooms dedicated to fire protection equipment for a JBLM master key #750.

6.5.3.8. High Security Doors: Provide doors for vaults, secure document storage rooms, SIPRnet communications rooms, and similar spaces requiring a high level of physical security with locks complying with the requirements contained in the security standards referenced for spaces designated under Functional Area Requirements in paragraph 3. These may include combination locks and other special hardware.

6.5.3.9. FIPS identification card capable proximity card readers: Hard-wire proximity card readers to a central control system, FIPS-capable, and shall be Millennium Entry access control system, manufactured by Millennium Group. Provide these where required elsewhere in the solicitation.

6.5.4. INTERIOR DESIGN

6.5.4.1. Special Signage: The following special signage is required.

- (a) Fire Department Connection: Mount sign on the building above exterior fire department connection. Sign shall be a minimum of 20 by 15 inches, mounted 8 feet above grade, with red text on white background.
- (b) Gas Shutoff: Mount sign on the building above the natural gas meter and valve. Sign shall be a minimum of 20 by 15 inches, mounted 8 feet above grade, with red text on white background.
- (c) Alarm System: Mount sign centered on all doors accessing rooms and spaces protected by alarm systems. Text at top of sign shall be as specified in AR 190-11, Appendix F. Bottom of sign shall have message in Braille.
- (d) Backflow Preventer Test Valve: Mount sign on the building above the backflow preventer test valve. Sign shall be a minimum of 20 by 15 inches, mounted 8 feet above grade, with red text on white background.
- (e) Fire Pump Test Valve: Mount the sign on the building above the fire pump test valve. Sign shall be a minimum of 20 by 15 inches, mounted 8 feet above grade, with red text on white background.
- (f) Fire Alarm Panel Equipment Room: Mount the sign on the door accessing room with text "Fire Alarm", minimum 16 by 2 inch letters, red text on white background.

- (g) Fire Suppression Sprinkler Riser Room: Mount the sign on door accessing room with text "Sprinkler Riser", 16 by 2 inch letters, red text on white background.
- (h) Post conspicuous sign(s), directing the fire department to all fire protection equipment. If fire department connection and/or PIV are located away from facility, stencil/label the building number with reflective 2-inch numbers and paint the valves shall be painted red

6.5.4.2. Handrails: All handrails shall be metal. Wood handrails are not permitted.

6.5.4.3. Floor in entry and circulation areas: Use porcelain tile or resilient tile flooring in high traffic (main circulation) areas of administrative facilities. The use of carpet in high traffic circulation areas is only be permitted at second floor areas where needed for acoustical purposes.

6.5.4.4. Casework: Use plywood substrates for casework.

6.5.4.5. Cook-top surfaces in Barracks: Do not use glass top range surfaces.

6.5.4.6. Fire Extinguishers in Barracks: Do not provide fire extinguisher brackets or cabinets in Barracks with automatic fire suppression systems, except provide cabinets in common cooking areas.

6.5.4.7. Wall and ceiling finish: Gypsum wallboard surfaces shall receive a Level 4 finish, drywall primer and light orange peel or similar finish texture to conceal imperfections; except exposed surfaces in wet locations, which shall receive a Level 5 finish, with drywall primer. Exposed concrete surfaces shall receive a Level 1 finish. Finish in accordance with standards listed in Applicable Criteria.

6.6. STRUCTURAL DESIGN

6.6.1. Design the facility assuming a ground snow load of 15 psf, Terrain Category C. However, design all roof structures for a minimum uniform roof snow load of 25 psf. An additional 5 psf rain-on-snow surcharge load shall be applicable in accordance with the requirements of ASCE 7.

6.6.2. Design the facility using a basic wind speed of 85 mph.

6.6.3. Design the facility using a Spectral Response Accelerations (SRA) for 0.2 seconds, $S_s=1.202$. SRA for 1.0 second, $S_1=0.380$.

6.6.4. Extend bearing portions of substructure to levels below frostline, not less than 18 inches below grade.

6.6.5. The structural system shall be compatible with building use. For example, do not locate columns in rooms requiring visibility or open space, such as entries, common areas, etc.

6.6.6. Refer to Appendix for additional hardening requirements when required.

6.7. THERMAL PERFORMANCE: No additional requirements. Enhanced thermal envelope may be used to improve energy performance in pursuit of lower energy usage and LEED point(s) and compliance with the guiding principles for high performance and sustainable buildings.

6.8. PLUMBING

6.8.1. PLUMBING FIXTURES: Plumbing fixtures shall include the following.

6.8.1.1. General: Where it is possible and economically feasible to use reclaimed water for such applications as irrigation, clearly label and mark all piping, fittings, equipment, and devices associated with such a system with the color purple.

6.8.1.2. Mop Sink: Provide floor-mount type.

6.8.1.3. CONTROLS: The DDC system shall have the capability of controlling domestic hot water circulation pumps and the temperature of domestic hot water.

6.8.1.4. Motion-activated plumbing fixture valves shall be hard-wired (not battery operated).

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.9.1. Site Power

6.9.1.1. General: Electrical power distribution is a 13,800-volt, 3-phase, 3-wire single-point grounded wye system. JBLM has adopted Tacoma Public Utilities (TPU) utility design criteria and construction standards for all power distribution work performed on the Installation. Design and construct in accordance with TPU standards, except for requirements associated with single-point grounding. The "single-point grounding" portion of the JBLM distribution system applies to a single reference point to ground at the substations only. JBLM is, for all intents and purposes, a Delta System, so the neutral conductor shown on the TPU details should be disregarded. Refer to TacomaPower.com for construction details and specifications and to JBLM Exterior Electric Shop at (253)-967-5840 for any questions regarding system requirements. Comply with the most current National Electrical Safety Code (NESC ANSI C-2), NFPA 70 and TPU standards for the Work of this Contract. JBLM standard details are available on <http://designstandards.lewis.army.mil/index1.htm>

(a) Design, furnish, and install a 15kV class distribution system that extends from the existing system, provides power for the facilities in this project, and provides expansion capability for future projects. Coordinate the distribution system expansion with the Public Works Electrical System Manager Engineer and the Exterior Electric Shop.

(b) Demolition: Turn over any existing distribution equipment required to be removed under this contract to the Public Works Exterior Electric Shop. Coordinate turnover with the Exterior Electric Shop Foreman.

(c) Seismic Bracing: Brace or anchor distribution equipment to resist horizontal forces acting in any direction per the site class and seismic use group as defined in the International Building Code and ASCE 7..

(d) System Coordination Study: Provide a coordination study to demonstrate that the equipment selected and system constructed meets the contract requirements for equipment ratings, coordination, and protection. Perform an arc flash study to determine the required personal protection equipment (PPE). Mark panelboards and other electrical equipment that require work when energized with PPE requirements per NFPA 70E Section 130.3(C). A registered professional engineer with demonstrated experience in power system coordination shall perform the study. Start coordination study at the first device located upstream of the equipment to be installed. Coordinate with JBLM PW Exterior Electrical Shop for upstream device information and for system fault currents.

6.9.1.2. Primary Duct Banks: Medium-voltage ducts shall be minimum 4-inch Schedule 40 PVC encased in controlled density fill (CDF) except under roads or paved areas subject to vehicular traffic, Provide Schedule 40 PVC in duct banks under roads or paved areas subject to vehicular traffic, encased in 3000 psi reinforced concrete. A 36-inch minimum burial depth is required to the top of the concrete encasement. Provide a 6-inch wide metallic warning tape above primary duct banks at 12 inches below finished grade. Arrange ducts so that they enter manholes and vaults at the lowest point. Provide at least one spare duct in all medium-voltage duct banks and a pull cord in all empty ducts. Provide bare copper ground conductor in the duct bank encasement and ground the conductor in all vaults. Minimum size is #2 for lateral feeder, #2/0 for lateral main feeder and #4/0 for main feeder.

6.9.1.3. Medium-Voltage Conductors: All medium-voltage conductors shall be 15kV, EPR, CU, 133 percent insulation, with insulation shielding. Main feeders shall be 500kcmil in 5 inch PVC duct with 600-ampere terminations; loop lateral main feeders shall be #4/0 AWG in 4 inch PVC duct with 200-ampere terminations; and lateral feeders to transformers shall be #2 AWG in 4" PVC duct.

(a) Splicing: Where splicing is required, provide 4-way in-vault junction assemblies in an appropriately sized vault, minimum size 7 feet x 7 feet x 6 feet deep, with a double hinged diamond-plate lid. Angle assemblies upward at a 45-degree angle to facilitate above-ground operation. All 200-ampere medium-voltage separable insulated connectors shall be of the load-break type. In-line and T-tap primary splices are not permitted. Provide test points on elbows at junction assemblies, pad-mount transformers and switches.

(b) Fire Taping: Provide fire protective tape on all medium-voltage conductors in manholes and in vaults under transformers, switches, and in-vault junction assemblies.

(c) Labeling: Label all cables by means of fiber, laminated plastic, or nonferrous metal tags indicating the cable type, conductor size, circuit number, circuit voltage, cable destination, and phase identification. coordinate labeling requirements with PW.

(d) Testing: Provide hi-pot and phase testing on all new primary conductors prior to energizing the cables.

6.9.1.4. Manholes and Vaults: Size manholes a minimum of 7 feet x 7 feet x 6 feet deep and comply with minimum cable bending radius requirements according to the current edition of the National Electrical Safety Code (NESC), except manholes with in-vault junctions shall be 7-feet by 7-feet by 6-feet deep. Install manholes at street intersections to facilitate street crossings, and space manholes a maximum of 500 linear feet apart or less as required to minimize pulling tension on the conductors. Provide vaults under all transformers and distribution switches with external man access hatch and with the pad-mount serving as a portion of the lid for the vault. Provide a minimum 6-inch diameter knockout at the bottom of the vault for drainage.

(a) Conductor Installation: Secure conductors to insulators on racks on all four walls of vaults, with secondary conductors mounted at least 8 inches above medium-voltage conductors, looped and racked a minimum of 360 degrees, and arranged in an approved manner that provides safe and rapid access to personnel during installation and maintenance. Conductors shall enter and exit the vault in such a way as to maintain the same direction of rotation, either clockwise or counterclockwise as appropriate.

(b) Vault Penetrations: Properly seal all transformer vault penetrations with waterproof grout to prevent water and moisture from entering the vault. Install ducts installed with the bell end flush with the vault's inside wall surface.

(c) Conduits: Install conduits with secondary conductors above conduits with medium-voltage main feeders.

(d) Testing: Provide DC hi-potential, shield continuity and phase rotation testing on all new primary conductors prior to energizing the cables.

6.9.1.5. Junction Pedestals: Provide junctions above ground or in manholes. Where four-way junctions are installed in manholes, provide manhole with diamond plate, two-section steel covers and set junctions upwards at a 45-degree angle to allow for hook-stick operation from above the manhole. Include insulated-bushing type parking stands adjacent to each separable loadbreak elbow to provide for cable isolation. Above-ground junction pedestals are required where the number of junctions exceeds four.

6.9.1.6. Distribution Switches: Primary distribution switches shall be fused, dead-front, bio-preferred liquid-filled, above-ground, vacuum type. All switch taps shall be switchable and 200A taps shall be fused. Install switches above ground on concrete vaults with external man access door and with the switch pad serving as a portion of the lid for the vault.

6.9.1.7. Padmount Distribution Transformers: Furnish and install liquid-filled, pad-mounted transformers for the facility in the project. Locate transformers to comply with AT/FP requirements. Based on the electrical load of the facility or facilities to be served, determine the KVA capacity and low-voltage rating of the transformer. Install outdoor, medium-voltage transformers on vaults.

(a) Transformer Specifications: Distribution transformers shall be new, loop-feed, with two separate windings per phase and shall be of the less-flammable, liquid-insulated type with bio-based biodegradable dielectric liquid derived from natural esters, complying with IEEE C57.12.00 and IEEE C57.12.21. Use high fire point fluids for indoor/vaults. Transformers shall be dead-front, equipped with oil-immersed bayonet-type overload fuses in series with partial range current-limiting fuses, five primary taps (two-above and two-below nominal), and three two-position load-break switches to permit opening and closing of either side of the loop, and the ability to de-energize the transformer with the loop remaining energized. Permanently attach high-voltage warning signs to each side of the transformer and include transformer KVA rating, secondary voltage and phase information at the front door of the secondary compartment. Provide copper-faced or stainless steel ground connection pads in the high- and low-voltage compartments, a dial-type thermometer, pressure-relief valve, liquid-level gauge, and drain valve. Provide oil sampling tube on transformers 500kVA and above. Provide removable MOV surge arrestors on the unused side of loop transformers, where applicable, with removable grounds. Where the transformer is used as a feed-through, provide fault indicators. Provide insulated bushing-type parking stands adjacent to each separable load-break elbow to provide for cable isolation. Provide padlock hasps and locks Coordinate lock style and material with the PW Exterior Electrical Shop. Provide bollards for protection in locations vulnerable to vehicular traffic per TPU standards.

(b) Primary Connections: Primary underground-to-overhead conductor connections shall be Burndy WEJTAP, Tyco AMPACT Wedge, or approved equal. Provide mechanical connectors at arrestor grounds.

(c) Distribution Cutouts: Where the existing overhead primary is tapped for service to a padmount transformer, the distribution fused cut-outs shall be of the load-break, silicone type that meets the following criteria: Open

outdoor load-break fused cut-out with Type K fuses conforming to NEMA C37.42 with rated amperes to match system requirements. Install silicone rubber insulators, clamshell terminal connectors, NEMA B bracket, 12 kAIC symmetrical fault-interrupting current rating, with solid cap fuse holder.

(d) Secondary Connections: Secondary conductor connections shall be compression type. Provide antioxidant compound where required by code. No penetrations are allowed through the transformer casing.

(e) Transformer Grounding: Provide a buried copper ground ring consisting of four ¾-inch x10-foot ground rods around each transformer pad and ground per NESC for a single-point grounded wye distribution system, with secondary neutral ground isolated from equipment ground and the ground strap removed. Neutral ground shall be 600V insulated copper wire at least 20 feet away from the transformer grounding ring and at least 90 degrees apart from the primary duct bank. Below-grade ground connections shall be of the exothermic type. Refer to JBLM PW for typical detail.

(f) Transformer Pad: Transformers shall sit on a concrete pad sized to serve as a portion of the lid for the vault below the transformer. Pads for all transformers include an external man access into the vault without removing the transformer. Access into the vault shall be through a double-hinged diamond plate lid. Vault for small transformers serving roadway utility loads, such as street lighting and traffic signals, may be 5 feet x 7 feet x 5 feet with padmount that includes external man access. All pads shall extend 6 inches beyond the transformer enclosure.

6.9.1.8. 600-volt Distribution: Provide a 600V underground distribution system from the secondary side of all transformers installed for service to buildings within the scope of this project. Cables shall be copper with 90 degree C insulation and suitable for use in an underground duct system. All secondary duct banks shall be direct-buried Schedule 40 PVC with a minimum of 3 inches of sand above and below ducts, except under roads or paved areas subject to vehicular traffic, and shall contain at least one spare duct. Provide Schedule 40 PVC in duct banks under roads or paved areas subject to vehicular traffic, encased in 3000 psi reinforced concrete. Minimum burial depth shall be 30-inches below finished grade. Provide a 6-inch metallic warning tape above secondary ducts at 12-inches below finished grade. Determine the secondary conductor size, duct size and quantity based on the transformer rating and building service requirements, adjusted for voltage drop. Secondary conductors shall not be larger than 500kcmil Provide galvanized rigid steel (GRS) conduit long-radius elbows and transitions from below to above grade and into buildings, and wrap all GRS conduits below grade to prevent corrosion. Provide compression type-connectors at the transformer secondary and the building service entrance switchboard.

6.9.2. Site Telecommunications

6.9.2.1. General: Government Telecommunications systems (voice/data) consist of the Army-owned telephone system, which provides Army communications, and the Local Area Network (LAN), Qwest Communications for residential and non-Army telephones, and COMCAST cable television. Furnish and install outside plant telecommunications manholes, ducts/conduits, and required distribution cables between identified point of connection and the building's telecommunications entrance facility Coordinate all communications requirements with the JBLM NEC, , specifically with the Plans Branch and the MCA Info Tech Project Manager Specialist and Team Members, through the Contracting Officer. Coordinate and attend inspections by NEC during each phase of construction.

(a) Coordination with Adjacent Construction Projects: Alert the Contracting Officer if coordination with adjacent construction projects is required by the Communications System Contractor.

6.9.2.2. Telecommunications Manholes:

(a) Telecommunications manholes shall meet existing infrastructure or approved equal, sized and oriented correctly, and shall be installed IAW manufacturer's instructions. Telecommunications manholes shall meet the following minimum criteria:

1. Concrete shall have a minimum compressive strength of 7000 psi at 28 days.
2. Design manholes/vaults to meet an AASHTO H-20 loading.
3. Manholes/vaults shall have galvanized embedded pulling irons in each corner, top and bottom.
4. Manholes/vaults shall have a minimum of four galvanized "C" channels per longitudinal side.
5. Equip manholes/vaults with PVC duct terminators at all points of entry/terminations (Term-a-duct or similar).

- (b) Plug all ducts, sub-ducts, and innerducts, whether main or subsidiary runs, using universal screw type duct plugs in telecommunications manholes and hand holes and at building entrances. Foam sealant is not acceptable.
- (c) Splice cases shall be of the pre-formed stainless steel type for copper and Tyco or approved equal for fiber splice cases. "Stretch cases" are not allowed. Do not use encapsulating compounds. Flash test using dry nitrogen gas to ensure dry and airtight seals.
- (d) Provide Notify NEC at least 48 hours prior to installation of telecommunications manholes and obtain approval on manhole orientation.
- (e) Provide grounding and bonding in telecommunications manholes to comply with I3A/TIA/EIA.
- (f) Provide labeling per JBLM NEC Standards.

6.9.2.3. Telecommunications Duct Banks. In addition to the requirements of I3A, encase duct banks in concrete in the Cantonment Area of JBLM.

6.9.3. Site Lighting

6.9.3.1. General: Provide exterior lighting appropriate for the building and parking lot functions and to comply with LEED and 10 CFR Part 436 – Federal Procurement of Energy Efficient Products. LED-type function. Provide street lighting (with photoelectric control) on metal poles with grounding system for any new streets and on streets that are modified as part of this project. To the extent possible, street lighting style shall match the type used on the existing streets within the project area, but must be LED type..

(a) Provide exterior induction type parking lot and pedestrian pathway lighting conforming to the applicable criteria Illuminating Engineering Society of North America (IESNA) recommended illumination levels and the state Non-Residential Energy Code. Provide metal poles with pole-mounted, color-corrected, induction or LED luminaires with cut-off feature to minimize light pollution per LEED. Site lighting circuits shall be direct-buried Schedule 40 PVC conduits encased in sand, except where subject to vehicular traffic; those locations shall use Schedule 40 PVC conduits encased in 3000 psi concrete, extended a minimum of 6 feet beyond the roadway or parking area. Provide 24-inch minimum burial depth and 6-inch wide warning tape at 12 inch minimum below finished grade and hand holes. Provide handholes at each lighting pole. Provide site lighting circuits and controls from the adjacent primary facility service. The photoelectric control shall have a manual bypass. Locate control panels in electrical rooms for access by PW. At Lawnmower Storage Buildings and similar locations, provide controls in a lockable NEMA 3R enclosure mounted at the exterior of the building.

(b) Security lighting for boundaries and controlled areas, when applicable, shall meet minimum illumination as indicated in the Security Engineering Technical Manual (SETM) 853, Volume 2.

6.9.4. Site Grounding

6.9.4.1. General: Soil resistivity at JBLM is extremely high, requiring additional measures to be taken in the grounding system design. Submit design drawings and calculations based on soil resistivity data and include measures such as counterpoise systems, buried plates, chemical grounds, and bentonite backfill to achieve the 10-ohm maximum resistance required by I3A for earth electrode subsystems. At a minimum, site grounding shall consist of a counterpoise grid system composed of 3/4-inch x 10-foot minimum copper clad steel ground rods interconnected by stranded bare #1/0 copper wire. Make connections using exothermic welds below grade for connections to electrical panels, communications system grounds, building steel and static ground points. Exposed ground connections shall be removable pressure type. Grounding and bonding shall comply with Article 250, NFPA 70.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.10.1. Power

6.10.1.1. General: Provide at least one exterior door on the ground floor to the main electrical room, sized as appropriate for equipment removal or maintenance..

6.10.1.2. Service Equipment: Provide a service entrance switchboard or main distribution panel in the main electrical room with copper bus, transient voltage surge suppression, fully rated and selectively coordinated with downstream circuit breakers. (Series-rated breakers are not acceptable.)

- (a) Provide a meter in the service switchboard that is compatible with the posts post's Java Application Control Engine (JACE)/DDC system. The meter shall measure kilowatt-hour demand averaged over a 15-minute interval, phase voltage, amps, frequency, true power, reactive power, apparent power, and power factor with an accuracy of 1.0 percent minimum. The meter shall include battery backup, on-board data storage for a minimum of 30 days, peak demand recording, time-of-use logging, and remote alarm annunciation for power outage, phase loss, and phase voltage over/under conditions. Provide communications conduit and wiring from the meter to the DDC system in the mechanical room with ANSI/CEA-709.1b protocol (LonWorks) output for communications using standard network variable types (SNVTs) for measured values.
- (b) Provide panelboards with copper bus and bolt-on circuit breakers, fully rated and coordinated between downstream and upstream circuit breakers. Locate panelboards and dry-type transformers in electrical rooms only with appropriate ventilation for heat dissipation.
- (c) Provide a lighting inverter system that meets the requirements of NFPA 101 for power to exit signs and egress lighting. Inverter shall include battery-operated computer-based self-test/self-diagnostic feature that automatically performs a minimum 30-second test and diagnostic routine at least once every 30 days and indicates failures and alarms. Automatic testing shall also include a yearly test for a minimum of 90 minutes, with failures and alarms indicated. Pass/fail status, test history, and alarm information shall be stored in memory and retrievable from unit display, with provisions for remote alarm indication and condition monitoring. Battery systems shall incorporate maintenance-free lead-acid or lead-calcium batteries. Locate the emergency power source in a dedicated electrical equipment room, readily accessible to maintenance personnel from the exterior of the facility, independent of building occupants.

6.10.2. Telecommunications

6.10.2.1. General:

- (a) Horizontal cabling will not exceed 295 feet from telecommunication room to outlet location per I3A Criteria and EIA/TIA standards.
- (b) Coordinate with the NEC Plans Branch during the design development process, preferably using mutually agreeable Over the Shoulder Review processes, as discussed in Section 01 33 16, Design After Award..
- (c) Provide a cable pull-through in the main NEC telecommunications room to a dedicated room with space on the telephone back board for commercial telephone and cable TV service providers. Qwest and Comcast will furnish and install their entrance cables and make connections to their equipment under separate contract with the Government. Coordinate with these providers and allow them access to perform their work.
- (d) The Contractor shall furnish and install interior cables from cable television outlets and from commercial telephone outlets that may be required for the facilities in this project back to the appropriate demarcation point.
- (e) Comcast and Qwest will make the connections to their equipment under separate contract with the Government.
- (f) Do not use J-hooks.

6.10.2.2. Provide a standard I3A/TIA/EIA information outlet on the telephone backboard for connection to the Base EMCS and coordinate the outlet location with JBLM PW.

6.10.2.3. Coordinate the following with NEC:

- (a) Telecommunications room equipment layout, grounding and bonding requirements, cable runways, labeling requirements, dedicated and convenience power outlets, backboards, concrete floor anti-static sealant, and air conditioning requirements. Provide backboards on at least three walls in telephone rooms.
- (b) Confirm standard administrative outlet configuration and labeling requirements (three CAT 6 cables to provide two data and one voice).

6.10.2.4. Cable test reports. Include the model/serial number of the test equipment, calibration certificate, and name of technician. Hand generated reports are not acceptable.

6.10.2.5. Provide CAT 6 cables that are UL-listed for wet environments where cables are routed in conduits installed inside or below slab-on-grade concrete floors.

6.10.2.6. Where protective distribution systems are required, provide systems by Holocom, Inc. or approved equal. Cable colors shall be blue for data, white for voice, red for SIPRNet, and yellow for JWICS.

6.10.2.7. Seismic Bracing: Brace or anchor equipment to resist horizontal forces acting in any direction per the site class and seismic use group as defined in the IBC.

6.10.2.8. Field Radio Antenna: Coordinate with contracting officer to determine if a field radio antenna is required by the building occupant. If required, provide a 2-inch raceway from the Duty Office (or location designated by the User) to the exterior of the building with a grounding bushing at the interior and a weather head at the exterior and coax cable for a field radio antenna connection. Coordinate installation requirements with the User.

6.10.3. INTRUSION DETECTION

6.10.3.1. General: For applicable facilities per paragraph 3, design and install a complete, fully tested intrusion detection system (IDS), including installation of Government-Furnished Contractor-Installed (GFCI) equipment, all conduits and conductors, drawings, system integration, and all testing.

6.10.3.2. The IDS is an Integrated Commercial Intrusion Detection System II (SAFENET ICIDS II) manufactured by MDI, Inc., 9725 Datapoint Drive, San Antonio, Texas 78229. IDS equipment and devices (RTU's, PPU, BMS, PIR, etc) shall be GFCI devices. Upon receipt of equipment, the contractor shall be responsible for all labor and installation warranty issues associated with installation. Coordinate system requirements with the Directorate of Emergency Services (DES) Physical Security.

6.10.3.3. The IDS shall use Version 6.2.1.6 SAFENET or the latest software or firmware for operating environment, with PB2000 processor, firmware revision 1.51, encrypted, and carried over the installation security VLAN. Upon award and at the time of LAN connection, request from DES Physical Security the correct VLAN to be assigned. System shall be fully compatible with the existing ICIDS II security system. Battery backup shall be provided for a minimum of six hours for all ICIDS components, to include subcomponents that support the communication operation and reporting of alarm events. Every effort should be made to place ESS systems on a generator back-up circuit. All ESS for secret compartmented information facilities are required to be provided with 24-hour back-up and to be connected to the facility emergency generator panel.

6.10.3.4. Work includes updating input points and graphics at the central monitoring station to provide a turnkey system. Contractor shall coordinate with the Government Construction Representative and Directorate of Emergency Services/Physical Security for access to the central monitoring station.

6.10.3.5. To reduce system compatibility problems, the IDS shall be installed by MDI-certified ICIDS II integrator with a minimum of five years of experience installing, integrating, and programming on systems comparable in size to JBLM ICIDS, and with the following clearances and certifications:

- Company TOP SECRET
- SECRET for system administrators, programmers, and supervisors
- CONFIDENTIAL for all others performing work on ICIDS

Provide proof of clearances and certifications to the DES.

6.10.3.6. Security Contractor and USACE project team should coordinate and receive security system design requirements approval for all ESS from DES Physical Security in advance of any pathway or construction effort.

6.10.3.7. Forward all drawings and specifications to the USACE Electrical Division for coordination with DES Physical Security for approval. Emboss seal all drawings and submittal packages, using a unique embossed and raised stamp seal typically with the name of the security (sub)contractor. Drawings are to be limited to not more than three sets. Label copies "Do Not Duplicate, Copy 1, 2, 3 (as applicable)", followed by "Security Sensitive".

6.10.3.8. Provide the contracting officer and DES Physical Security a minimum of two weeks' notice for scheduling the Government's performance verification test (PVT). Complete the Contractor performance test in advance of the Government PVT. Prior to scheduling the PVT, submit Contractor performance test results, substantiating that the system meets contract requirements. DES will perform 72 hours of endurance testing in

advance of final acceptance. Representatives of the USACE project team, Contractor, and DES will attend the PVT.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11.1. The HVAC systems for these facilities shall provide heating, ventilation, and (in some cases) cooling, with a design intended for personnel comfort and cooling of electronic equipment (computer servers, communication equipment, etc.). While select spaces may be air-conditioned as required, whole building air-conditioning is not authorized at JBLM. In addition to Telecommunications Rooms and Telecommunications Equipment Rooms, (including SIPRNET ROOMS, where applicable for specific facility type), the following rooms/areas require air-conditioning: NONE. Do not use ozone-depleting refrigerants.

6.11.2. Locate all primary mechanical equipment such as air-handlers, boilers, hot water heaters, pumps, storage tanks, etc., inside a main mechanical room where possible. Unless specifically called for by a standard design in paragraph 3, do not install mechanical equipment on the roof. All equipment shall be of the high-efficiency type and in compliance with ASRAE 90.1.

6.11.3. DESIGN CRITERIA: All equipment and controls shall be integrated and communicate with the existing JBLM Tridium Niagara system via LonMark/LonTalk and/or BACnet communication protocols.

6.11.4. DESIGN REQUIREMENTS

6.11.4.1. Design conditions include the following.

(a) Outdoor Conditions

(Reference: ASHRAE Puget Sound Chapter "Recommended Outdoor Design Temperatures, Washington State," 2nd Edition)

Winter Dry-Bulb (0.6 percent):	24° F
Summer Dry-Bulb:	82° F
Summer Wet-Bulb:	64° F

(b) Indoor Conditions

Winter Dry-Bulb:	68° F
Summer Dry-Bulb:	77° F (air-conditioned spaces only)

(c) Ventilate elevator equipment rooms per IBC and WAC Chapter 296-96.

6.11.4.2. Have State of Washington inspect boiler and provide certification documentation to the contracting officer's representative.

6.11.4.3. Heat and ventilate the buildings without the use of mechanical cooling. Design system for 100 percent outdoor economizer controls to satisfy building sensible cooling load calculated at an outside air temperature of 55° F using heating and ventilation air handlers. Provide the capability to control outside air to minimum ventilation rates per ASHRAE 62.1-2006, including the use of CO2 sensors and occupancy sensors for demand control ventilation.

6.11.4.4. Telecommunications Rooms and Telecommunications Equipment Rooms, (including SIPRNET ROOMS, where applicable for specific facility type) require cooling. Electrical rooms may require cooling. Perform heat load calculations to include all anticipated heat-producing equipment located within these spaces and provide a temperature control and ventilation system based on manufacturer's recommended data as well as published criteria such as can be found in "ASHRAE Thermal Guidelines for Data Processing Environments." The design for electrical rooms shall use mechanical cooling only if heat load calculations indicate that ventilation (outdoor air) alone cannot maintain recommended room temperature. Where mechanical cooling is required, provide permanently installed units that have the capacity for both heating and cooling to increase efficiency gains and reduce the number of separate systems requiring maintenance. The type of units supplied shall conform to the following order of preference: (1) ground source heat pumps, (2) air source heat pumps, and (3) hybrid natural gas/electric units. Base the choice of system on life-cycle cost effectiveness as determined by Subpart A of 10 CFR 436. The unit can have a backup natural gas component for less than optimal conditions, if needed; the unit should

be capable of operating in economizer mode to ventilate the space with outdoor air until the thermostat calls for mechanical cooling. Include exhaust systems all toilet rooms, shower rooms, janitor rooms, kitchens, clothes dryers, and electrical and mechanical rooms. Exhaust toilet rooms per ASHRAE 62.1

6.11.4.5. In the absence of published manufacturer's specifications, provide environmental conditions in accordance with one of the following.

- (a) ANSI T1.304 -1997 Ambient Temperature and Humidity Requirements for Network Equipment in Controlled Environments
- (b) ASHRAE Thermal Guidelines for Data Processing Environments
- (c) Network Equipment Building System (NEBS)
- (d) Telcordia GR-63-CORE

6.11.4.6. Cast iron boilers of any type are not allowed.

6.11.5. DIRECT DIGITAL CONTROL AND ENERGY MANAGEMENT CONTROL SYSTEM: The direct digital control (DDC) and UMCS in Paragraph 6 take precedence over the DDC and UMCS requirements in Paragraph 5 of this SOW. The UMCS uses a Tridium Niagara AX platform that is designed to provide interoperability using LonMark/LonWorks and BACnet compliant controllers.

6.11.5.1. Compatibility: Provide a building DDC system compatible with and remotely programmable and configurable through the (JACE) Network Area Controller (NAC) and the PW Tridium AX system via the existing base-wide IT wide area network (WAN) operated by NEC. The JACE Network Area Controllers (NAC) have been approved by NEC for connection to the WAN/LAN. NEC does not allow routers on their WAN/LAN system.

6.11.5.2. Integration with Base-wide DDC System. The building control system shall integrate with the Tridium system, control the indoor environment, monitor and manage fuel and energy consumption, schedule preventative maintenance, control interior and exterior lighting, monitor water usage and hot water temperatures at tank and at hot water heater, discharge outlet and after the mixing valve; and monitor electrical consumption, monitors packaged equipment controls, and equipment alarms. All motors are to be monitored for actual status using current transmitters.

6.11.5.3. Interface Standards. Provide a LonWorks or BACnet interface for packaged equipment controllers, when necessary for network communication. The DDC system shall be in strict accordance with section 23 09 23 (formerly 15910) as published on the JBLM design standards website (<http://designstandards.lewis.army.mil/index.htm>).

6.11.5.4. LEED Compliance: The DDC system shall have measurement and monitoring capability to provide verification of LEED "Silver" criteria

6.11.5.5. Workstation. Provide a centrally located (usually the mechanical room) workstation for each building's control system to monitor and control each zone setpoint. One DDC system workstation shall be provided for each project in at least one of the project buildings. The workstation shall include one desktop computer, monitor, etc. Performance shall meet current technology standards. Provide web supervisor workstation software, licensed to JBLM/GSA in the "Owner" section. Provide a security workstation cabinet with the following features:

- (a) Locking upper compartment with Plexiglass window providing viewable access to most 20-inch monitors.
- (b) Locking pull-out drawer: Facilitates ergonomic operation of keyboard, mouse, and convenient storage of small supplies; keyboard and supplies can be accessed even while top and bottom compartments are locked.
- (c) Full-size locking bottom doors in front and rear for complete access to equipment and cables; lower compartment features one fixed bottom and one adjustable shelf for desktop or tower style PCs, printer, paper or supplies; louvers in rear provide equipment ventilation.
- (d) Heavy-duty all welded steel top and bottom sections bolt together for easy assembly; Top Level Compartment (internal): 20-3/4" W x 21-1/4" D x 23-1/2" H; Overall Dimensions: 21" W x 22-1/2" D x 59-1/2" H.

- 6.11.5.6. Monitoring and Alarms. This system shall have alarms identifying when it is outside normal operation from sequence or setpoints. Provide interlock and safety routines that safeguard and prevent progressive damage to equipment due to monitored failures.
- 6.11.5.7. Remote Access: The system shall be user-programmable and have access from remote locations, multiple layers of secured access to data and program information, and a graphical user interface accessible through any standard web browser without manufacturer's software.
- 6.11.5.8. Graphical User Interface. The graphical user interface shall allow for hierarchical graphical navigation between systems and provide graphical representations of systems, access to real-time data for systems, the ability to override points in a system, and access to all supervisory monitoring and control functions. Each system display shall distinguish clearly between the following point data types and information: real-time data, user-entered data, overridden or operator-disabled points, devices in alarm (unacknowledged), and out-of-range, bad, or missing data. The software shall allow the user to create, modify, and delete displays and graphic symbols. Configure monitoring and control (M&C) software functionality. Use JBLM standard graphical pages for system graphic displays, including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.
- 6.11.5.9. Protection of Wiring. Where wiring external to control panels is exposed to damage, the Contractor shall install all wiring, including low-voltage wiring, in metallic raceways (plenum rated wiring where not exposed to damage). Install wiring without splices between control devices and DDC panels.
- 6.11.5.10. Grounding. Install instrumentation grounding as necessary to prevent ground loops, noise, and surges from adversely affecting operation of the system.
- 6.11.5.11. Labeling and Identification. Tag cables and conductor wires at both ends, with the identifier shown on the shop drawings. Identify equipment manufacturer's literature, stating compatibility with JBLM Tridium system and LonMark/LonWorks or BACnet.
- 6.11.5.12. Demonstration and Performance Verification Test. Demonstrate system communication by downloading programs and configuring programs to controllers over the network from the workstation. Disconnect the network server communication line from the JACEs, ensure all the JACEs continue to perform their local functions and disconnect AC power from JACEs and verify that all control functions of the DDC system continue to operate. Perform a PVT under 100% Government supervision prior to system acceptance. The PVT shall demonstrate that 100% of the system performs as specified, including but not limited to demonstrating that the system correctly performs the sequences of operation.
- 6.11.5.13. Utility Meter Monitoring. Where natural gas is used, provide a gas meter interface to connect to the DDC/UMCS system for monitoring gas usage. Provide electric and water meter interfaces to connect to the DDC/UMCS system for monitoring electric and water usage.
- 6.11.5.14. Computers. Provide one notebook computer with performance meeting current technology standards and the latest version of the Tridium AX Supervisor and AX Workbench engineering tool software, licensed to JBLM/GSA in the owner section. All computers shall have the NEC image installed through DPW IT Department before its DDC software is installed and licensed. All desktop computers, monitors, and laptop provided shall be qualified at the Silver level or higher per the Electronic Product Environmental Assessment Tool (EPEAT) (<http://www.epeat.net/PublicSearch.aspx>).
- 6.11.5.15. Room Temperature Sensors and Thermostats. Room temperature sensors shall have pushbutton occupancy override with duration adjustable in programming. Room temperature sensors shall be user adjustable with setpoint and adjustment span limited through programming at BAS/EMCS front end. Temperature sensors shall have a limited set-point and be adjustable remotely through the BAS/EMCS. Both override time frame and lever adjustment range shall be adjustable through DDC GUI. Thermostats shall not be line voltage. Room temperature sensors shall not have a digital or analog readout indicating current temperature.
- 6.11.5.16. Additional Software Licenses. Provide M&C software with Web Supervisor license for additional JACEs. Provide M&C software with a license for no less than the quantity of points to support systems being controlled and monitored, plus 10 percent more for expansion. The software shall be expandable in both the number of points and the number of clients supported in order to support system expansion.

6.11.5.17. Additional DDC Controller Capabilities. Provide DDC controllers that have an additional 10% unused inputs and outputs for future expansion.

6.11.5.18. Training. Provide a minimum of 16 hours of training, consisting of 8 hours of classroom and 8 hours of field training at the project site on the installed BAS/DDC/UMCS. Upon completion of this training, each student, using appropriate documentation, shall be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

6.12. ENERGY CONSERVATION

6.12.1. Inclusion of Renewable Energy Features. The following renewable energy features have been determined lifecycle cost effective, are included in the project budget and shall be provided:

6.13. FIRE PROTECTION

6.13.1. FIRE ALARM AND MASS NOTIFICATION. Mass notification shall be fully functional as part of the Monaco D21 fire system. Use installation approved messages provided by JBLM Directorate of Emergency Services (DES), Physical Security Branch. The system shall also connect to the current head-end equipment (CCU) and made fully functional from the remote site located at the JBLM Emergency Operation Command facility.

6.13.2. Fire Alarm Requirements.

6.13.2.1. Install all components of the fire alarm panel, transmitter, and sprinkler system risers at a convenient location with a direct exterior access door acceptable to the authority having jurisdiction for maintenance, inspection, and testing.

6.13.2.2. Do not install components above 72-inches on walls. Maintain a 36-inch clearance around components; Maintain a 36-inch clearance around FDC and BFP intakes/discharges.

6.13.2.3. Wiring on fire alarm system components shall be Class A (Style 7) signaling line circuits (SLC), Class A notification appliance circuits (NAC) and Class A Initiating Device Circuit (IDC). Overhead, underground, or direct burial cables shall be specifically approved for the purpose. Protect fire alarm wiring that runs underground at both ends with UL listed surge suppressors.

6.13.2.4. Fire alarm systems with 4 or more devices per alarm initiating device zone shall be of the addressable type, except in troop housing where all systems shall be addressable type. Provide all fire alarm panels and associated cabinets with UL listed surge suppressors on incoming AC power.

6.13.2.5. Do not include annunciators in fire alarm system designs unless specifically called for by JBLM Fire Department.

6.13.2.6. Manual pull stations shall be double action type. Stations employing glass rods are not acceptable. Key panels and manual pull stations for a JBLM master key # 211.

6.13.2.7. Provide phenolic resin labels on all fire alarm cabinets to indicate function, as well as, in electrical supply cabinets. Labels shall be red in color with white lettering. Paper or cloth tape labels are not permitted except on wiring.

6.13.2.8. Provide training courses for the operations and maintenance staff. The system maintenance, expansion, and modification training shall consist of on-site and/or off-site class room training as necessary to fully qualify the government operations and maintenance technicians to perform all levels of maintenance, expansions, and modifications to the fire alarm system, hardware, software, and miscellaneous components. This training will include (and turn over to the government) all proprietary licenses, software, and tools to perform the required tasks. Provide all specialized equipment and/or training to program, edit existing program, add or delete devices, etc. as a part of the fire alarm system. Include and pay all costs necessary for two government personnel to attend training, to include airfare, lodging and meals, unless factory training is provided at JBLM.

6.13.2.9. Smoke detectors in addressable systems shall be photoelectric analog type, providing information that the control unit stores in memory, and uses to provide a history of detector stability, and notification at the control unit where sensitivity is outside its acceptable sensitivity range. Smoke detectors in sleeping rooms shall be fully addressable, self resetting (no manual reset required at the FACP) with a sounder base operated from the fire alarms controls panel power and having reverse polarity sounding capability for local and general alarms. Activation of the sleeping room smoke detector will only set off its sounder base for local audible alarm. A general alarm will also activate the sounder base. Upon a local alarm condition the detector shall be non-latching, not require reset at the fire alarm panel after a local alarm, and not cause the transmitter to send an alarm or trouble.

6.13.2.10. All as-built drawings shall show the exact run of conduit, quantity of wires, wire color code, location of every initiating device, signaling device, module, and any major junction boxes or power supplies. The plans will also show loop number and the address of each device or module if the system is addressable.

6.13.2.10.1. When warranty is in effect, the Contractor shall be required to respond (physically go to building in Alarm or Trouble) within 48 hours to an ALARM CONDITION and 72 hours to a TROUBLE CONDITION. Provide warranty management plan in accordance with Section Closeout Submittals..

6.13.3. For dry sprinkler systems, use only beltless and oilless compressors.

6.13.4. Coordinate with JBLM Life Safety System Manager for permit process, design, installation , and acceptance testing requirements for life safety systems

6.13.5. If a fire suppression sprinkler riser is located within a facility and is not in a mechanical room or dedicated fire protection room, the riser shall be installed in a fenced enclosure with access gate and a padlock keyed for a JBLM master key #750 to prevent access by building occupants to valves and controls. Do not locate valves and controls in stairwells.

6.13.6. Provide GE SupraSafe 2HSR or Suprasafe1 (key type: Titan Code C4733) rapid entry key boxes on exterior of building on the left side and within 6 feet of main entry and on interior adjacent to elevators.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 3.

6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: RSU Facility Guard Shack / Storage Building.

6.14.3. Credit Validation: LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required. Registration and payment of registration fees will be by the Contractor. Administration/team management of the online project will be by the Contractor. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is required. The Contractor will obtain LEED certification prior to project closeout. Application, payment of certification of fees and all coordination with USGBC during the certification process will be by the Contractor. GBCI interim review of design phase data is not required by the Government but is recommended. Government validation during project execution does not relieve or modify in any way the Contractor's responsibility to satisfy all requirements for certification as defined by LEED and GBCI. Contractor is not responsible for design phase LEED documentation of any unaltered portion of the design that is accomplished by others. If the project includes unaltered complete design by others, during the certification process Contractor will coordinate all GBCI comments on LEED credits that fall outside Contractor's scope of responsibility with the Government for coordination with the Designer of Record, and Contractor will not be penalized if project fails to achieve certification at the minimum required level due to loss of credits that are the responsibility of others.

6.14.4. Commissioning: See Appendix M for Owner's Project Requirements document(s).

6.14.5. LEED Credits Coordination. The following information is provided relative to Sustainable Sites and other credits.

SS Credit 1 Site Selection:

Project site IS NOT considered prime farmland.

Project site is five feet or more above 100-year flood elevation.

Project site contains no habitat for threatened or endangered species.

No portion of project site lies within 100 feet of any water, wetlands or areas of special concern.

Project site WAS NOT previously used as public parkland.

SS Credit 2 Development Density & Community Connectivity.

Project site DOES NOT meets the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meets the criteria for this credit.

SS Credit 4.1 Public Transportation Access.

Project site DOES NOT meets the criteria for this credit.

EA Credit 6 Green Power.

35% of the project's electricity WILL NOT be provided through an Installation renewable energy contract. Do not purchase Renewable Energy Credits (REC's) to earn this credit.

MR Credit 2 Construction Waste Management.

The Installation does not have an on-post recycling facility available for Contractor's use.

Regional Priority Credits (Version 3 only)

The project zip code is 98433.

6.14.6. LEED Credit Preferences, Guidance and Resources. See Appendix L LEED Project Credit Guidance for supplemental information relating to individual credits.

6.14.7. Not Used

6.14.8. Additional Information

6.14.8.1. JBLM Sustainability Philosophy is to apply systematic considerations of environmental impact, energy use, natural resources, economy, and quality of life so the end result is a quality, high-performance building. Priorities in the order listed below provide guidance on the relative importance of sustainable strategies to JBLM as an aid in design decision. However, additional proven sustainable strategies are encouraged.

(a) The following are Fort Lewis' eight sustainability goals.

- (1) Reduce installation stationary source and non-tactical motor vehicle air emissions 85 percent by 2025.
- (2) Reduce total energy consumption by 30 percent by 2015.
- (3) Sustain all activities on post using renewable energy sources and generate all electricity on post by 2025.
- (4) Create sustainable neighborhoods for a livable community that enhances the Puget Sound region.
- (5) Cycle all material use to achieve zero net waste by 2025.

- (6) Maintain the ability of JBLM to meet its current and future military missions without compromising the integrity of natural and cultural resources, both on the installation and regionally.
- (7) Recover all listed and candidate federal species in the South Puget Sound region.
- (8) Treat all wastewaters to Class A reclaim standards by 2025 to conserve water resources and improve Puget Sound water quality.
- (b) The following priorities support JBLM sustainability goals.
 - (1) Energy savings, including architectural strategies, such as building orientation, daylighting, and building envelope efficiencies.
 - (2) Water savings/reuse.
 - (3) Low-emitting, non-toxic materials.
 - (4) Reusable/recyclable building materials (do not use materials that must be disposed of in a landfill when removed from the building).
 - (5) Tie in to neighborhood sustainability features (e.g., continuance of bike lanes, neighborhood gray water treatment and reuse system, use of neighborhood heat plants).
 - (6) Minimize turf areas/water intensive landscapes; use xeriscaping; use low-impact development strategies for stormwater.
 - (7) Provide operable windows and views for all building occupants.

6.14.8.2. Energy efficiency incentives and rebates through PSE may be available to the Contractor's. Contact PSE energy management engineer to confirm the available rebates and incentive programs that is suited for the project.

6.15. ENVIRONMENTAL

6.15.1. All actions shall comply with JBLM Installation Regulation 200-1 (Environmental Protection and Enhancement) and Section 01 57 20.00 10 (Environmental Protection). Installation Regulation 200-1 is available at <http://designstandards.lewis.army.mil/index1.htm> and Section 01 57 20.00 10 (Environmental Protection).

6.15.2. Emergency Unexploded Ordnance (UXO) Response: If UXO is encountered, immediately stop all activity in the UXO area and clear the area. Immediately contact JBLM EOD professionals to conduct an emergency response. Additionally, immediately contact UXO construction support staff, if present, or call 911 or Military Police. Notify the USACE Contracting Officer's Representative (COR) of the incident, as soon as possible. EOD professionals will determine the threat to human health and the environment and the safety measures required. Do not return to work until EOD or other JBLM safety personnel determine the area is safe to enter. Include procedures for such scenarios with contact numbers in the Health and Safety Plan (HASP) for the fieldwork, per the Washington State Department of Labor and Industries requirements and JBLM Regulation 200-01.

6.15.3. Monitoring wells may be encountered during construction activities. Protect any monitoring wells encountered during construction activities against damage. Repair any monitoring well damaged in any way, at the Contractor's expense. Contact the COR if a monitoring well is encountered. The COR who will contact JBLM Environmental Restoration Program (Point of Contact: James Gillie [253-966-1774]) to determine the disposition of the well

6.15.4. Other environmental issues (i.e., underground storage tanks, transite (asbestos) piping, transformers, etc.) may be encountered during construction activities. Contact the COR if an environmental issue is encountered.

6.15.5. Land Use Controls: Contact the COR to determine if land use controls are in effect at the work area. These may include, but are not limited to, hazardous substances on site, restrictions on construction activities, and/or special worker health and safety requirements.

6.15.6. Hazardous Materials: Coordinate all hazardous materials with and obtain authorization from the JBLM Pollution Prevention Program or JBLM YTC Environmental Compliance prior to use on JBLM YTC. Provide hazardous material inventories, as specified in the documents referenced at 6.15.1, above.

6.15.7. Green Procurement: JBLM requires the purchase, supply, and use of environmentally preferable products and services. The JBLM Guide to Green Procurement for Construction is available for reference in the "Reference Manuals" section of the JBLM design standards webpage (<http://designstandards.lewis.army.mil/index.htm>). Additional information is available from the JBLM Green Procurement Program at 253-966-6466 or LEWISPWGreenProcurement@conus.army.mil.

6.15.8. Environmental Management System (EMS): Contractor shall be familiar with the JBLM environmental policy and shall ensure that this information is considered and incorporated into all projects. Maintain a copy of the policy on site. The installation policy can be found at https://sustainableforlewis.army.mil/EMS/pdf/FL_EnvironmentalPolicy.pdf. Additional information on the installation EMS can be obtained by contacting the installation EMS coordinator at 253-966-6470.

6.15.9. Waste Procedures.

6.15.9.1. All procedures for solid waste, including hazardous waste, shall comply with the documents referenced at 6.15.1. This includes the submission of a nonhazardous solid waste diversion report to JBLM ED or to JBLM YTC ED. Prior to leaving JBLM, manifest all hazardous waste, as specified in the documents referenced at 6.15.1.

6.15.9.2. Turn in all construction and demolition scrap, in accordance with the latest JBLM Scrap Turn-In Policy Memorandum.

6.15.10. Spill Response (JBLM): Notify the JBLM fire department (dial 911) immediately in the event of a hazardous spill. The first person on scene that identifies the hazard must notify the fire department – this may or may not be the Contractor's designated POC.

6.15.10.1. After notifying the fire department, call JBLM PW Environmental Services (253-967-4786) and the COR.

6.15.10.2. The JBLM ED is responsible for contacting federal, state, and local reporting channels if a reportable quantity is released to the environment.

6.15.10.3. Provide a spill response plan for review by the COR and JBLM ED. List reporting channels, telephone numbers, and the hazardous materials stored on site and include copies of material safety data sheets for the hazardous materials and a site diagram outlining where the storage sites are located. All supervisors on site shall be trained in the execution of the spill plan. Document all training.

6.15.11. Contractor Generated Spills: Manage, store, dispose, and dispense petroleum products, hazardous materials, and hazardous wastes according to all federal, state, and local regulations (to include JBLM Installation Regulation 200-1).

6.15.11.1. Comply with all Washington State Department of Transportation (WSDOT) requirements associated with hazardous materials/hazardous waste, including proper container marking/labeling and vehicle placarding when transporting hazardous materials/hazardous waste on or off the installation.

6.15.11.2. Obtain Government approval prior to removal of any hazardous waste from the installation. Only an authorized hazardous waste transporter having an EPA Identification Number shall remove the hazardous waste, and the waste shall be recorded on a Uniform Hazardous Waste Manifest (EPA Form 8700-22). An authorized representative of JBLM Environmental Services must sign all hazardous waste manifests prior to removal from JBLM. See documents referenced at 6.15.1 for more information..

6.15.12. SOLID WASTE DIVERSION PRACTICES

6.15.12.1. All construction activities at JBLM shall require at least 60 percent of construction and demolition materials such as excess lumber, roofing, drywall, carpet, piping, cardboard, etc., to be diverted from the landfill.

6.15.12.2. Government policy shall apply sound environmental principles in the design, construction, and use of facilities. As part of the implementation of that policy, the Contractor shall practice efficient waste management when sizing, cutting, and installing products and materials and shall use all reasonable means to divert construction and demolition waste from landfills and incinerators and facilitate their recycling or reuse.

6.15.12.3. Submit a waste management plan in accordance with Contract Section 01 57 20.00 10, Environmental Protection, and prior to initiating any site preparation work. In addition to the requirements in that Section, Include the following:

- (a) Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas and equipment to be used for processing, sorting, and temporary storage of wastes.
- (b) Characterization, including estimated types and quantities, of the waste to be generated.
- (c) Name of landfill and/or incinerator to be used and the estimated costs for use, assuming no salvage or recycling on the project.
- (d) Identification of local and regional reuse programs, including JBLM programs and non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.
- (e) List of specific waste materials to be salvaged for resale, salvaged and reused, or recycled. Identify recycling facilities to be used, including those on JBLM.
- (f) Identification of materials that cannot be recycled/reused with an explanation or justification.
- (g) Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

6.15.13. CONTAMINATED SOILS: In the event that abnormalities, discolorations, odors, oil, or other signs of potential contamination by hazardous materials are encountered during excavation, soil borings, or other construction activities, stop work and notify the Government immediately. Coordinate with the JBLM ED Environmental Restoration Program. Follow with written notice within 24 hours, indicating date, time, and location of potential contaminants encountered. In the event contaminated soil is encountered, all field and laboratory technicians must be trained and certified for handling hazardous materials.

6.15.14. HISTORIC PROPERTIES: Stop work immediately and notify the COR and the JBLM Cultural Resources Program Manager if unidentified/unanticipated cultural resources are discovered/found during excavation or other construction activities.

6.16. PERMITS

6.16.1. The Government has obtained no permits/licenses to this project.

6.16.2. The Contractor shall obtain ALL permits/licenses required for this project. Submit permits to the Contracting Officer and PW ED to allow time for review and revisions with ultimate submittal at least 10 days before commencing removal activities. Provide amendments to the permits to the Contracting Officer and ED. The Contractor shall be responsible for determining fee basis and paying all filing fees.

6.16.3. Upon notice to proceed, immediately begin working required permits, and supporting information required by the Government to process permits.

6.16.4. DIG PERMITS. Obtain a dig permit from JBLM DPW (509-577-3407).

6.16.5. Complete all applications for the Clean Air permit and submit to JBLM ED for review. Once reviewed, incorporate changes and forward application and fee to the appropriate agency.

6.16.6. CONSTRUCTION GENERAL PERMIT (CGP): Construction sites that will have a land disturbance of one or more acres (or are part of a common plan of development that will disturb an acre or greater) or have multiple construction sites under one contract if the total land disturbance for all sites is greater than one acre, must be covered under the EPA's NPDES CGP if discharges enter, or have the potential to enter, surface waters of the United States or the JBLM stormwater system, which discharges to United States waters

6.16.6.1. Submit an NOI in accordance with the CGP. Obtain coverage prior to any land-disturbing activities.

6.16.6.2. Prepare a site-specific SWPPP and submit it to JBLM PW; it must be approved prior to submitting the NOI to the EPA. The SWPPP and the CGP must be followed as appropriate until final stabilization has occurred. The SWPPP is a living document and must be updated when site conditions change.

6.16.6.3. To stop permit coverage, submit a Notice of Termination (NOT) to the EPA. Submit a copy of the NOT to PW Stormwater Program.

6.16.6.4. If at any time permit conditions are not being met, contact JBLM PW Stormwater Program within 24 hours.

6.16.7. BORROW PIT AUTHORIZATION. See paragraph 6.4.8.

6.16.8. CRANE PERMITS. Crane Permits are obtained by contacting the Air Traffic Control Branch (253-966-6136). Provide notice of any crane activity at least 35 days prior to use.

6.16.9. TEMPORARY ROAD CLOSURES: Submit a traffic control plan in accordance with the Manual on Uniform Traffic Control Devices to the Contracting Officer for approval of any temporary road closures. After approval, provide 14 calendar days notice to the Government before the closure.

6.16.10. All permit applications must indicate the following address as the building and site owner:

JBLM PW
ATTN: IMNW-PWE
Box 339500 (Building 2012)
Joint Base Lewis-McChord, WA 98433-9500

6.16.11. Additional Required Project Specific Permits:

Permits/ Approvals required include but are not limited to the following:

a) Existing NEPA Section 106 Consultation last modified Feb 24, 2009. This document may require modification if scope/location/size of the project deviates from approved. Refer to Appendix E for further information.

b) Washington State Department of Health Water Distribution System Extension Permit will be required. Supporting documentation shall be provided to COE for their use in obtaining this permit.

c) Monitoring / Extraction wells and other equipment located onsite are owned by JBLM Environmental Restoration Program/ Compliance Cleanup Program. Alterations to any item requires their approval. Obtain all required permits prior to any well work. See Appendix E for further information.

d) Utility Outages: All utility outage request dates and times will be set by the appropriate government agency at JBLM. Each individual outage request (according to the type of outage) will be set for either normal working hours or after hours/weekends. Outages shall be coordinated on a case by case basis through the Contracting Officer or appropriate government agency. Utility outages frequently affect more than one facility and require extensive coordination. The contractor shall perform all tests, have passed all inspections as required in the specifications and/or on the project drawings and coordinate between the Contracting Officer and/or their representative(s) and government shops prior to requesting the utility outage. The contractor shall submit all request for outages 14 days prior to the utility outage requested date for the government approval.

e) Traffic Diversion/Street Closings: The contractor may make arrangements satisfactory to the appropriate government agency at JBLM for the diversion of traffic. The contractor shall, at his own expense, provide all materials to erect traffic control devices and perform work necessary for the construction and maintenance of access roadways/drives for the diversion of traffic. The contractor shall notify the appropriate government agency and the fire department headquarters when any street is closed or obstructed. The contractor shall submit all requests for traffic diversion and/or street closings 14 days prior to the actual diversion/closing of street(s) for government approval.

f) Exterior Utility Installation: Where new utilities cross roads, driveways, and parking lots to be paved under this contract, install utilities prior to paving. If paving has occurred prior to installing the utilities, jacking or boring is required. It is preferred to jack and bore utilities under all existing paved roads unless otherwise directed by the

appropriate government agency and/or JBLM representative(s). Otherwise, open cut excavation is allowed if the pavement cut width is a minimum of 15-feet wide across the entire width of the road. Install new utilities that connect to existing utilities located under existing paved areas by open cut excavation. A minimum 15-foot pavement cut width is required for all open cut excavations.

6.17. DEMOLITION

6.17.1. DISPOSAL, RECYCLING AND REUSE OF MATERIALS.: Waste material generated from the project may be recycled or reused on post in designated recycling and reuse areas. Dispose, recycle and reuse all other materials not designated for on post recycling or reuse off post at the Contractor's expense. JBLM recycling and reuse areas for the specified materials are as follows

- (a) Sequalitchew Training Area and Center for Environmental Education and Earthworks ("Earthworks"). Materials accepted for recycling purposes are concrete, asphalt, brick, concrete block (if not painted with lead-based paint), rock, land clearing/clearing debris, and excess uncontaminated soil.
- (b) Uncontaminated excavated or unsuitable soils are accepted at the following pits subject to availability and direction of JBLM PW, Sequalitchew, Gray Army Airfield Pit, East Gate Pit, and Lincoln Pit. Non-hazardous lead-contaminated soil (top 6 inches from designated areas) is accepted at former Landfill 2 subject to availability and direction from PW.
- (c) Submit a "Borrow Source Use and Entry Notification Form" to dispose of uncontaminated soils within JBLM at the designated sites and under the direction of PW.
- (d) Coordinate all recycling activities, disposal of materials on JBLM, and obtaining of permit forms through PW, Solid Waste and Recycling Program Manager JBLM PW/ED, ; Phone: (253) 966-6452; cell: (253) 377-1420; fax: (253) 967-9937; e-mail: ron.norton1@us.army.mil.

6.17.2. The Government maintains the right to salvage all materials from the building until the NTP date.

6.17.3. Assume that all demolition buildings will have no salvage value.

6.17.4. Fill depressions caused by the removal of demolished materials such as building pavements, sidewalks, utility lines, and pad, etc., to grade, compact per soil compaction requirements, and slope to drain towards the nearest appropriate structural stormwater management measure.

6.17.5. If fuel-contaminated soils are found during demolition or cut/fill operations, cease work immediately and notify either the Contracting Officer representative or the Contracting Officer for resolution that can include removal of the contaminated soil, filling, and capping area with clean, uncontaminated soil. Coordinate with JBLM ED to ensure proper classification and procedures prior to removal of contaminated soil.

6.17.6. ABANDONED UTILITIES: Locate and remove any abandoned utilities found onsite that may interfere with the site development or building.

6.17.7 SITE DEMOLITION: The contractor shall make a thorough assessment of the site prior to mobilizing for clearing to locate and avoid damaging any unmarked utilities or other features.

(a) The existing site is heavily treed. Merchantable timber is required to be logged in accordance with JBLM requirements where appropriate refer to paragraph 6.4.10.

(b) Dig Permit" is required from JBLM prior to site excavation activities. All existing utilities shall be field verified and any facilities found to be within building limits shall be re-routed and old pipes demolished or abandoned in place as directed by the COR.

(c) During site demolition it is possible that remnants of old demolition projects will be encountered - including asbestos and other potentially hazardous materials.

(d) During site demolition it is possible that items of archaeological merit will be encountered at which time all work will cease, the site will be secured and JBLM personnel will be contacted as appropriate.

(e) All demolished materials are to be legally and appropriately disposed. Under no circumstances will any demolished materials be buried on JBLM.

2. Monitoring/Extraction wells will be encountered across the site. The Contractor shall locate and mark all wells prior to clearing or other site disturbing activities. It may be necessary to adjust wellheads where wells fall within construction limits and JBLM may identify certain wells for demolition. All work on monitoring/extraction wells shall be performed by a contractor licensed for well work in the State of Washington and in accordance with UFC 3-280-01A 'Guidance for Ground Water/ Fuel Extraction and Ground Water Injection Systems', UFGS 33 24 00.00 20 'Extraction/ Monitoring Wells', State, Local and Federal Regulations and JBLM. Repair any wells damaged in any way at the contractor's expense. See Appendix E for additional guidance.

3. Tree/stump removal shall be to a minimum of two feet below grade in areas beneath structures (unless recommended otherwise by the Contractor's geotechnical engineer) including pavement/gravel parking areas and at least one foot elsewhere.

4. Refer to Appendix CC for the Hazardous Material report on Buildings 9004, 9508, and 9513.

6.18. ADDITIONAL FACILITIES

None.

End of Section 01 10 00.TBD

**SECTION 01 33 00.TBD
SUBMITTAL PROCEDURES
(DESIGN-BUILD TASK ORDERS)**

1.0 GENERAL

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

1.14. INFORMATION ONLY SUBMITTALS

1.0 GENERAL

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 33 30 apply to this task order, except as otherwise specified herein.

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred. The Government will retain four (4) copies of the submittal and return one (1) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain two (2) copies of information only submittals.

End of Section 01 33 00.TBD

SECTION 01 33 16 DESIGN AFTER AWARD

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.2. DESIGNER OF RECORD

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

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ATTACHMENT B FURNITURE, FIXTURES AND EQUIPMENT REQUIREMENTS

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

ATTACHMENT E LEED SUBMITTALS

ATTACHMENT F BUILDING INFORMATION MODELING REQUIREMENTS

ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.1.1. The information contained in this section applies to the design required after award. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.

1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than six (6) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.

1.1.3. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.1.4. **INTEGRATED DESIGN.** To the maximum extent permitted for this project, use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for siting, energy, water, materials and indoor environmental quality and ensures incorporation of these goals. Consider all stages of the building lifecycle, including deconstruction.

1.2. DESIGNER OF RECORD

Identify, for approval, the Designer of Record ("DOR") that will be responsible for each area of design. One DOR may be responsible for more than one area. Listed, Professional Registered, DOR(s) shall account for all areas of design disciplines. The DOR's shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). If the deliverables are not ready for release for construction, identify them as "preliminary" or "not for release for construction" or by using some other appropriate designation. The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

Submit for Government acceptance, a Design Quality Control Plan in accordance with Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL before design may proceed.

3.1.2. Post Award Conference

3.1.2.1. The government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractor representatives shall participate. All designers need not attend this first meeting. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

3.1.2.2. The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL), Partnering (see below and SCR: Partnering), and the initial design conference (see below).

3.1.2.3. The government will introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

3.1.3. Partnering & Project Progress Processes

3.1.3.1. The initial Partnering conference may be scheduled and conducted at any time with or following the post award conference. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality control staff, and contractor construction management staff. This partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses, shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, partnering meetings will be held at or in the vicinity of the project installation.

3.1.3.2. As part of the partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/ Furniture, Fixtures & Equipment (FF&E) design approval, project closeout, etc. The government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.1.4. Initial Design Conference

The initial design conference may be scheduled and conducted at the project installation any time after the post award conference, although it is recommended that the partnering process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference should be limited to site and is discouraged for other items. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone and to make sure any needs the contractor has are assigned and due dates established as well as who will get the information. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning the BIM Implementation Plan demonstration at this meeting. The DB Contractor shall conduct the initial design conference.

3.1.5. Pre-Construction Conference

Before starting construction activities, the Contractor and Government will jointly conduct a pre-construction administrative conference to discuss any outstanding requirements and to review local installation requirements for start of construction. It is possible there will be multiple Pre-Construction Conferences based on the content of the design packages selected by the Contractor. The Government will provide minutes of this meeting to all participants.

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

The stages of design submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for this project, within the parameters listed below. As a minimum, the Government expects to see at least one interim design submittal, at least one final design submittal before construction of a design package may proceed and at least one Design Complete submittal that documents the accepted design. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. See discussion on waivers to submission of one or more intermediate design packages where the parties partner during the design process. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning BIM and the various stages of design submittals and over-the-shoulder progress reviews.

3.2.1. Site/Utilities

To facilitate fast-track design-construction activities the contractor may submit a final (100%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comment, and resolution times from this specification apply, except that the Contractor shall allow the Government a 14 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2. Interim Design Submittals

The Contractor may submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01.00 10 PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal and to the Building Codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. See below for a waiver, where the parties establish an effective over-the-shoulder progress review procedure through the partnering process that would eliminate the need for or expedite a formal intermediate design review on one or more individual design packages.

3.2.3. Over-the-Shoulder Progress Reviews

To facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available within the Contractor's standard design practices) or at the Contractor's design offices or other agreed location, when practicable to the parties. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews shall normally be provided in electronic format, rather than in hard copy. If the Government and Contractor establish and implement an effective, mutually agreeable partnering procedure for regular (e.g., weekly) over-the shoulder review procedures that allow the Government reviewers the opportunity to keep fully informed of the progress, contents, design intent, design documentation, etc. of the design package, the Government will agree to waive or to expedite the formal intermediate design review period for that package. The Contractor shall still be required to submit the required intermediate design documentation, however the parties may agree to how that material will be provided, in lieu of a formal consolidated submission of the package. It should be noted that Government funding is extremely limited for non-local travel by design reviewers, so the maximum use of virtual teaming methods must be used. Some possible examples include electronic file sharing, interactive software with on-line or telephonic conferencing, televideo conferencing, etc. The Government must still perform its Code and Contract conformance reviews, so the Contractor is encouraged to partner with the reviewers to find ways to facilitate this process and to facilitate meeting or bettering the design-build schedule. The Contractor shall maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal intermediate design review. The formal intermediate

review procedures shall form the contractual basis for the official schedule, in the event that the partnering process determines that the formal intermediate review process to be best suited for efficient project execution. However, the Government pledges to support and promote the partnering process to work with the Contractor to find ways to better the design schedule.

3.2.4. Final Design Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5. Design Complete Submittals

After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a back-check review and submit the final, design complete documents, which shall represent released for construction documents. The requirements for the design complete submittals are described hereinafter.

3.2.6. Holiday Periods for Government Review or Actions

Do not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving). Exclude such dates and periods from any durations specified herein for Government actions.

3.2.7. Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the government in writing, at least one (1) week prior to the submittal, in order to accommodate the Government reviewers' other scheduled activities. If a design submittal is over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submission receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, the Suspension of Work and Defaults clauses provide the respective remedy or relief for the delay.

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (See Special Contract Requirement: Deviating From the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. Include the DCM procedures in the Design Quality Control Plan. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System" (see below and Attachment C).

3.3.2. Tracking Design Review Comments

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. See Attachment C for details on how to establish an account and set-up the DrChecks system for use on the project.

3.3.3. Design and Code Checklists

Develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation. See Section 01 45 04.00 10 Contractor Quality Control, Attachment D for a Sample Fire Protection and Life Safety Code review checklist and Attachment E for LEED SUBMITTALS.

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submission and proceed directly to final design on the sitework and utilities package). The DB Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued government concurrence with the design work. Include the interim submittal review periods and conferences in the project schedule and indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below. See also Paragraph: **Over-the-Shoulder Progress Reviews** for a waiver to the formal interim design review.

3.4.2. Procedures

After receipt of an Interim Design submission, allow the Government fourteen (14) calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the-shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the COR will furnish, to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. Furnish disposition of all comments, in writing, through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately. The Interim Review conference will be held for each design submittal at the installation. Bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

3.4.3. Conference Documentation

3.4.3.1. In order to facilitate and accelerate the Government code and contract conformance reviews, identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

3.4.3.2. The DB Contractor shall prepare meeting minutes and enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Incorporate valid comments. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain government concurrence with the design work presented.

3.5. INTERIM DESIGN REQUIREMENTS

Interim design deliverables shall include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

3.5.1. Drawings

Include comments from any previous design conferences incorporated into the documents to provide an interim design for the "part" submitted.

3.5.2. Design Analyses

3.5.2.1. The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references and pay particular attention to the following listed items:

3.5.2.2. For parts including sitework, include site specific civil calculations.

3.5.2.3. For parts including structural work, include structural calculations.

- (a) Identify all loads to be used for design.
- (b) Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
- (c) Provide calculations for all principal roof, floor, and foundation members and bracing and secondary members.
- (d) Provide complete seismic analyses for all building structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone for which the facility is being constructed.
- (e) Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.
- (f) See also the Security (Anti-Terrorism) requirements below for members subject to Anti-Terrorist Force Protection (ATFP) and Progressive Collapse requirements.
- (g) Fully coordinate and integrate the overall structural design between two different or interfacing construction types, such as modular and stick-built or multistory, stacked modular construction. Provide substantiation of structural, consolidation/settlement analysis, etc., as applicable, through the interfaces.

3.5.2.4. For Security (Anti-Terrorism): Provide a design narrative and calculations where applicable, demonstrating compliance with each of the 22 standards in UFC 4-010-01, which includes Design of Buildings to Resist Progressive Collapse (use the most recent version of UFC 4-023-03, regardless of references to any specific version in UFC 4-010-01). Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. Show complete calculations for members subjected to ATFP loads, e.g., support members of glazed items (jamb, headers, sills) connections of windows to support members and connections of support members to the rest of the structure. For 3 story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.

3.5.2.5. For parts including architectural work, include building floor area analysis.

3.5.2.6. For parts including mechanical work, include HVAC analysis and calculations. Include complete design calculations for mechanical systems. Include computations for sizing equipment, compressed air systems, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation is required (see paragraph 3.5.5.2 for list of acceptable software). Based on the results of calculations, provide a complete list of the materials and equipment proposed with the manufacturer's published cataloged product installation specifications and roughing-in data.

3.5.2.7. For parts including life safety, include building code analysis and sprinkler and other suppression systems. Notwithstanding the requirements of the Codes, address the following:

- (a) A registered fire protection engineer (FPE) must perform all fire protection analyses. Provide the fire protection engineer's qualifications. See Section 01 10 00, paragraph 5 for qualifications.

- (b) Provide all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.
- (c) Provide classification of each building in accordance with fire zone, building floor areas and height and number of stories.
- (d) Provide discussion and description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Electronic Systems.
- (e) Provide hydraulic calculations based on water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply. Include copies of Contractor's water flow testing done to certify the available water source.

3.5.2.8. For parts including plumbing systems:

- (a) List all references used in the design.
- (b) Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.
- (c) Detail calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping; LP gas piping and tanks, fuel oil piping and tanks, etc., as applicable.
- (d) When the geotechnical report indicates expansive soils are present, indicate in the first piping design submittal how piping systems will be protected against damage or backfall/backflow due to soil heave (from penetration of slab to the 5 foot building line).

3.5.2.9. For elevator systems:

- (a) List all criteria codes, documents and design conditions used.
- (b) List any required permits and registrations for construction of items of special mechanical systems and equipment.

3.5.2.10. For parts including electrical work, include lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations.

3.5.2.11. For parts including telecommunications voice/data (including SIPRNET, where applicable), include analysis for determining the number and placement of outlets

3.5.2.12. For Cathodic Protection Systems, provide the following stamped report by the licensed corrosion engineer or NACE specialist with the first design submission. The designer must be qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. He/she must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection Specialist, or must be a registered professional engineer with a minimum of five years experience in corrosion control and cathodic protection. Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.

3.5.2.13. Air Barrier System: Provide a narrative of the design and installation requirements for the Air Barrier system. As part of the design quality control process an air barrier consultant shall review drawing details to assure that details of critical Air Barrier components are properly detailed and incorporated during the design drawings and process (i.e. window flashing details, penetration in air barrier details, door flashing details, roofing/ceiling barrier interface details and etc.). Furnish the Government written review details and results.

3.5.3. Geotechnical Investigations and Reports:

3.5.3.1. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load

resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc. Provide an assessment of post-construction settlement potential including total and differential. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required. Include calculations to support the recommendations for bearing capacity, settlement, and pavement sections. Include supporting documentation for all recommended design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), etc. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. Include the raw field data. Arrange a meeting with the Government subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the Government provided preliminary soils information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the Government furnished preliminary soils investigation, which result in a change to the design or construction. Any equitable adjustment is subject to the provisions of the contract's Differing Site Conditions Clause.

3.5.3.2. Vehicle Pavements: The Contractor's geotechnical report shall contain flexible and rigid pavement designs, as applicable for the project, including design CBR and modulus of subgrade reaction and the required compaction effort for subgrades and pavement layers. Provide Information on the types of base course materials available in the area and design strengths.

3.5.3.3. The Contractor and the professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

3.5.4. LEED Documentation:

Assign a LEED Accredited Professional, responsible to track LEED planning, performance and documentation for each LEED credit through construction closeout. Incorporate LEED credits in the plans, specifications and design analyses. Develop LEED supporting documentation as a separable portion of the Design Analysis and provide with each required design submittal. Include the LEED Project checklist for each non-exempt facility (one checklist may be provided for multiple facilities in accordance with the LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects and the LEED SUBMITTALS (Attachment E, herein) with each submittal. Final design submittal for each portion of the work must include all required design documentation relating to that portion of work (example - all site credit design documents with final site design). Submittal requirements are as indicated in Attachment E, LEED SUBMITTALS. Submit all documentation indicated on Attachment E as due at final design at final design submittal (for fast-track projects with multiple final design submittals, this shall be at the last scheduled final design submittal). All project documentation related to LEED shall conform to USGBC requirements for both content and format, including audit requirements and be separate from other design analyses. Maintain and update the LEED documentation throughout project progress to construction closeout and shall compile product data, receipts, calculations and other data necessary to substantiate and support all credits claimed. The Government may audit any or all individual credits. Audit documentation is not required to be submitted unless requested. These requirements apply to all projects. If the project requires the Contractor to obtain USGBC certification, the Contractor shall also be responsible for obtaining USGBC certification and shall provide written evidence of certification with the construction closeout LEED documentation submittal. Install the USGBC building plaque at the location indicated by the Government upon receipt. If Contractor obtains USGBC interim design review, submit the USGBC review to the Government within 30 days of receipt for information only.

3.5.4.1. LEED Documentation for Technology Solution Set. If the Solicitation provides a Prescriptive Technology Solution Set, use of the Technology Solution set has no effect on LEED documentation requirements. Provide all required LEED documentation, including energy analysis, in accordance with LEED requirements when using the Technology Solution Set.

3.5.5. Energy Conservation:

3.5.5.1. Refer to Section 01 10 00, Paragraph 5. Interim and Final Design submittals shall demonstrate that each building including the building envelope, HVAC systems, service water heating, power, and lighting systems meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Use Compliance Documentation forms available from ASHRAE and included in the ASHRAE 90.1 User's Manual for this purpose. The Architectural Section of the Design Analysis shall include completed forms titled "Building Envelope Compliance Documentation Parts I and II". The Heating Ventilating and Air Conditioning (HVAC) Section of the Design Analysis shall include a completed form titled "HVAC Simplified Approach Option - Part I" if this approach is allowed by the Standard. Otherwise, the HVAC Section of the Design Analysis shall include completed forms titled "HVAC Mandatory Provisions - Part II" and "HVAC Prescriptive Requirements - Part III". The Plumbing Section of the Design Analysis shall include a completed form titled "Service Water Heating Compliance Documentation". The Electrical Section of the Design Analysis shall include an explanatory statement on how the requirements of ASHRAE 90.1 Chapter 8 Power were met. The Electrical Section of the Design Analysis shall also include a completed form titled "Lighting Compliance Documentation".

3.5.5.2. Interim and Final Design submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must also include calculations in a separate Energy Conservation Section of the Design Analysis which demonstrate and document (a) the baseline energy consumption for the facility or facilities under contract, that would meet the requirements of ANSI/ASHRAE/IESNA Standard 90.1 and (b) the energy consumption of the facility or facilities under contract utilizing the materials and methods required by this construction contract. Use the USGBC Energy and Atmosphere (EA) Credit 1 compliance template / form or an equivalently detailed form for documenting compliance with the energy reduction requirements. This template / form is titled PERFORMANCE RATING METHOD and is available when the project is registered for LEED. The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with two exceptions: a) receptacle and process loads may be omitted from the calculation; and b) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline for rating above standard design meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction. This calculation shall address all energy consuming systems in a single integrated methodology. Include laboratory fume hoods and kitchen ventilation loads in the energy calculation. They are not considered process loads. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable. The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

3.5.6. Specifications

Specifications may be any one of the major, well known master guide specification sources. Use only one source. Examples include specifications from MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. The UFGS are available through the "Whole Building Design Guide" website, using a websearch engine. Manufacturers' product specifications, utilizing CSI's Manu-Spec, three part format may be used in conjunction with the selected specifications. The designers of record shall edit and expand the appropriate Specifications to insure that all project design requirements, current code requirements, and regulatory requirements are met. Specifications shall clearly identify, where appropriate, specific products chosen to meet the contract requirements (i.e., manufacturers' brand names and model numbers or similar product information). Note that the UFGS are NOT written for Design-Build and must be edited appropriately. For instance, they assume that the Government will approve most submittals, whereas in Design-Build, the Designer of Record has that action, unless this Solicitation requires Government approval for specific submittals. The Designer of Record should also note that some UFGS sections might either prescribe requirements exceeding the Government's own design standards in applicable references or contain requirements that should be selected where appropriately required by the applicable references. At any rate, where the UFGS are consistent with other major, well known master commercial guide specifications, then generally retain such requirements, as good practices.

3.5.7. Building Rendering

Present and provide a draft color computer, artist, or hand drawn rendering with the conceptual design submittal of the building exterior. Perspective renderings shall include a slightly overhead view of the entire building to

encompass elevations and the roof configuration of the building. After Government review and acceptance, provide a final rendering, including the following:

Three (3) 18" x 24" color prints, framed and matted behind glass with project title underneath the print.

One (1) Image file (high resolution) in JPG format on CD for those in the submittal distribution list.

3.5.8. Interim Building Design Contents

The following list represents what the Government considers should be included in the overall completed design for a facility or project. It is not intended to limit the contractor from providing different or additional information as needed to support the design presented, including the required design analyses discussed above. As the Contractor develops individual design packages and submits them for Interim review, include as much of the applicable information for an individual design package as is developed at the Interim design level for review purposes. These pieces shall be developed as the design progresses toward the design complete stage.

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

- (a) Design Narrative
- (b) Architectural Floor Plans, Typical Wall and Roof Sections, Elevations
- (c) Finish schedule
- (d) All required equipment
- (e) Special graphics requirements
- (f) Door and Window Schedules
- (g) Hardware sets using BHMA designations
- (h) Composite floor plan showing all pre-wired workstations
- (i) Structural Interior Design (SID) package: See ATTACHMENT A for specific requirements
- (j) Furniture, Fixtures & Equipment (FF&E) design package: See ATTACHMENT B for specific requirements
- (k) Air Barrier Design: Details of all Air Barrier components, (i.e. window flashing details, penetrations in air barrier details, door flashing details, roofing/ceiling barrier interface details and etc.)

3.5.8.4. Structural Systems. Include:

- (a) Drawings showing principal members for roof and floor framing plans as applicable
- (b) Foundation plan showing main foundation elements where applicable
- (c) Typical sections for roof, floor, and foundation conditions

3.5.8.5. Plumbing Systems

- (a) Show locations and general arrangement of plumbing fixtures and major equipment
- (b) Plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Include natural gas (and meter as required), (natural gas and meter as required), (LP gas), (fuel oil) and other specialty systems as applicable.
- (c) Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required

3.5.8.6. HVAC Systems

- (a) Mechanical Floor Plans: The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:

- (1) Room designations.
- (2) Mechanical legend and applicable notes.
- (3) Location and size of all ductwork and piping.
- (4) Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards).
- (5) Pre-Fabricated Paint Spray Booth (where applicable to project scope)
- (6) Paint Preparation Area (where applicable to project scope)
- (7) Exhaust fans and specialized exhaust systems.
- (8) Thermostat location.
- (9) Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).
- (10) Location of all air handling equipment.
- (11) Air balancing information.
- (12) Flue size and location.
- (13) Piping diagram for forced hot water system (if used).
- (b) Equipment Schedule: Provide complete equipment schedules. Include:
 - (1) Capacity
 - (2) Electrical characteristics
 - (3) Efficiency (if applicable)
 - (4) Manufacturer's name
 - (5) Optional features to be provided
 - (6) Physical size
 - (7) Minimum maintenance clearances
- (a) Details: Provide construction details, sections, elevations, etc., only where required for clarification of methods and materials of design.
- (b) HVAC Controls: Submit complete HVAC controls equipment schedules, sequences of operation, wiring and logic diagrams, Input/Output Tables, equipment schedules, and all associated information. See the Statement of Work for additional specific requirements.

3.5.8.7. Fire Protection and Life Safety.

- (a) Provide plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Include the following types of information:
 - (1) The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.
 - (2) The location and coverage of any fire detection systems
 - (3) The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.)
 - (4) The location of any other major fire protection equipment
 - (5) Indicate any hazardous areas and their classification
 - (6) Schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required
- (b) Working plans and all other materials submitted shall meet NFPA 13 requirements, with respect to required minimum level of detail.

3.5.8.8. Elevators. Provide:

- (a) Description of the proposed control system
- (b) Description, approximate capacity and location of any special mechanical equipment for elevators.

3.5.8.9. Electrical Systems.

(a) Electrical Floor Plan(s): Show all principle architectural features of the building which will affect the electrical design. Show the following:

- (1) Room designations.
- (2) Electrical legend and applicable notes.
- (3) Lighting fixtures, properly identified.
- (4) Switches for control of lighting.
- (5) Receptacles.
- (6) Location and designation of panelboards. Clearly indicate type of mounting required (flush or surface) and reflect accordingly in specifications.
- (7) Service entrance (conduit and main disconnect).
- (8) Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.
- (b) Building Riser Diagram(s) (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.
- (c) Load Center Panelboard Schedule(s): Indicate the following information:
 - (1) Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting).
 - (2) Branch Circuit Designations.
 - (3) Load Designations.
 - (4) Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
 - (5) Branch Circuit Connected Loads (AMPS).
 - (6) Special Features
- (d) Lighting Fixture Schedule(s): Indicate the following information:
 - (1) Fixture Designation.
 - (2) General Fixture Description.
 - (3) Number and Type of Lamp(s).
 - (4) Type of Mounting.
 - (5) Special Features.
- (e) Details: Provide construction details, sections, elevations, etc. only where required for clarification of methods and materials of design.

3.5.8.10. Electronic Systems including the following responsibilities:

- (a) Fire Detection and Alarm System. Design shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.)
- (b) Fire Suppression System Control. Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Clearly describe how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. Designate all components shown on floor plans "FS system components" (as opposed to "Fire Alarm components"). Show location of FS control panels,

HVAC control devices, sensors, and 120V power panel connections on floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors sub-zoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and under floor detectors with distinct symbols and indicate sub-zone of each.

- (c) Public Address System
- (d) Special Grounding Systems. Completely reflect all design requirements in the specifications and drawings. Specifications shall require field tests (in the construction phase), witnessed by the Government, to determine the effectiveness of the grounding system. Include drawings showing existing construction, if any.
- (e) Cathodic Protection.
- (f) Intrusion Detection, Card Access System
- (g) Central Control and Monitoring System
- (h) Mass Notification System
- (i) Electrical Power Distribution Systems

3.5.8.11. Separate detailed Telecommunications drawings for Information Systems including the following responsibilities:

- (a) Telecommunications Cabling
- (b) Supporting Infrastructure
- (c) Outside Plant (OSP) Cabling - Campus or Site Plans - Exterior Pathways and Inter-Building Backbones
- (d) Include a layout of the voice/data outlets (including voice only wall & pay phones) on telecommunication floor plan drawing, location of SIPRNET data outlets (where applicable), and a legend and symbol definition to indicate height above finished floor. Show size of conduit and cable type and size on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Show underground distribution conduit and cable with sizing from point of presence to entrance facility of building.
- (e) Layout of complete building per floor - Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways including Serving Zones Drawings - Drop Locations and Cable ID's
- (f) Communication Equipment Rooms - Plan Views - Tech and AMEP/Elevations - Racks and Walls. Elevations with a detailed look at all telecom rooms. Indicate technology layout (racks, ladder-racks, etc.), mechanical/electrical layout, rack elevation and backboard elevation. They may also be an enlargement of a congested area of T1 or T2 series drawing.

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

A final design review and review conference will be held upon completion of final design at the project installation, or – where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.) through the Partnering process. Include the final design conference in the project schedule and shall indicate what part of the design work is at 100% completion. The final design conference will be held after the Government has had seven (7) calendar days after receipt of the submission to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter period.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, submittal register and design analyses for Government review and acceptance. The 100% design submission shall consist of drawings, specifications, updated design analyses and any permits required by the contract for each package submitted. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date. Include the 100% SID and 100% FF&E binders for government approval. The Contractor shall have performed independent technical reviews (ITR's) and back-checks of previous comment resolutions, as required by Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL, including providing documentation thereof. Use DrChecks or other acceptable comment tracking system during the ITR and submit the results with each final design package

3.7.1. Drawings

3.7.1.1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted.

3.7.1.2. Prepare all drawings with the Computer-Aided Design and Drafting (CADD)/Computer-Aided Design (CAD) system, organized and easily referenced electronically, presenting complete construction information.

3.7.1.3. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.

3.7.1.4. Provide detail drawings that illustrate conformance with the contract. Include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules that agree with the submitted SID binders.

3.7.1.5. The design documents shall be in compliance with the latest version of the A/E/C CAD Standard, available at <https://cadbim.usace.army.mil/CAD>. Use the approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.

3.7.1.6. CAD System and Building Information Modeling (BIM) (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order.)

All CAD files shall be fully compatible with MicroStation V8 or higher. Save all design CAD files as MicroStation V8 or higher files. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8 Workspace.

(a) CAD Data Final File Format: During the design development capture geo-referenced coordinates of all changes made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc) as a result of this contract. There is no mandatory methodology for how the geo-referenced coordinates will be captured, however, Engineering and Construction Bulletin No. 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects identifies the format for final as-built drawings and data sets to be delivered to the government. Close-out requirements at the as-built stage; require final geo-referenced GIS Database of the new facility along with all exterior modifications. The Government will incorporate this data set into the Installation's GIS Masterplan or Enterprise GIS System. See also, Section 01 78 02.00 10 Closeout Submittals.

(b) Electronic Drawing Files: In addition to the native CAD design files, provide separate electronic drawing files (in editable CAD format and Adobe Acrobat PDF version 7.0 or higher) for each project drawing.

(c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Fonts that are not included as part of the default CAD software package installation or recognized as an allowable font by the A/E/C CAD Standard are not acceptable in delivered CAD files. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.

(d) Deliver BIM Model and associated Facility Data files in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F. See Attachment F for additional BIM requirements.

(e) Drawing Index: Provide an index of drawings sheet in CAD as part of the drawing set, and an electronic list in Microsoft Excel of all drawings on the CD. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title, containing the data for each drawing.

(f) Hard Copies: Plot submitted hard copy drawings directly from the "electronic drawing files" and copy for quantities and sizes indicated in the distribution list at the end of this specification section. The Designers of Record shall stamp, sign and date original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.7.2. Design Analyses

3.7.2.1. The designers of record shall update, finalize and present design analyses with calculations necessary to substantiate and support all design documents submitted.

3.7.2.2. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where, applicable (name, version, vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned government reviewer.

3.7.2.3. All disciplines review the LEED design analysis in conjunction with their discipline-specific design analysis; include a copy of the separable LEED design analysis in all design analysis submittals.

3.7.2.4. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3. Specifications

Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

Prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00, SUBMITTAL PROCEDURES) with each design package. Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project, for the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will furnish the DB Contractor's design manager a DD Form 1354 checklist to use to produce a draft Form 1354. Submit the completed checklist and prepared draft Form DD 1354 with the 100% design in the Design Analysis. The Corps will use these documents to complete the final DD 1354 upon completion of construction.

3.7.6. Acceptance and Release for Construction

3.7.6.1. At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Officer or the ACO will accept the Final Design Submission for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.7.6.2. Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted contract proposal, or limit the Contractor's responsibility of design as prescribed under Special Contract Requirement: "Responsibility of the Contractor for Design" or limit the Government's rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design Submission and Review Conference and after Government acceptance of the Final Design submission, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the final, design complete documents. Label the final design complete documents "FOR CONSTRUCTION" or use similar language. In addition to the final drawings and specifications, the following deliverables are required for distribution and field use. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the

Government may perform a back-check of the released for construction documentation. Promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

General: The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. Provide copies of each design submittal and design substantiation as follows (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order):

Activity and Address	Drawing Size (Full Size) 22 x 34 Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) 11 x 17 Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF& <u>.dgn</u>)	Furniture Submittal (Per Attachment B)	Structural Interior Design Submittal	BIM Data DVD (Per Attach F)
Commander, U.S.Army Engineer District Seattle District	0/0	2/0	2/0	2	1	2	3
Commander, U.S.Army Engineer District, Center of Standardization Fort Worth District	2/0	1/0	2/0	6	N/A	2	2
Installation	0/0	2/0	2/0	22	2	0	0
U.S.Army Corps of Engineers Construction Area Office	4/0	7/0	13/0	34	1	6	3
Information Systems Engineering Command (ISEC)	0/0	0/1	0/0	1	*Partial Set (Work Station/System Furniture- IT Details)	N/A	1
Huntsville Engineer & Support Center, Central Furnishings Program	N/A	N/A	N/A	N/A	1 Interim/Refer to attachment B for the final submission Qty	N/A	N/A
Other Offices	0/0	0/2	0/2	2	N/A	2	0

***NOTE: For partial sets of drawings, specifications and design analyses, see paragraph 3.9.3.3, below.**

****NOTE: When specified below in 3.9.2, furnish Installation copies of Drawings as paper copies, in lieu of the option to provide secure web-based submittals.**

3.9.2. Web based Design Submittals

Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to twenty seven (27) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

3.9.3.2. Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

3.9.3.3. Provide partial sets of drawings, specifications, design analyses, etc., as designated in the Table in paragraph 3.9.1, to those reviewers who only need to review their applicable portions of the design, such as the various utilities. The details of which office receives what portion of the design documentation will be worked out after award.

3.10. AS-BUILT DOCUMENTS

Provide as-built drawings and specifications in accordance with Section 01 78 02.00 10, CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes

All tile information, including tile grout color and tile patterns.

- All flooring finishes, including patterns.
- All door, door frame finishes and door hardware finishes
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim

- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All Roof Finishes
- All Brick and Cast Stone Samples
- All Exterior Insulation and Finish Samples
- All Glass Color Samples
- All Exterior Metals Finishes
- All Window & Door Frame Finishes
- All Specialty Item Finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

ATTACHMENT B FURNITURE, FIXTURES & EQUIPMENT (FF&E) REQUIREMENTS

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

1.1. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The Contractor's interior designer, NOT A FURNITURE DEALER, shall develop the design. FF&E is the selection, layout, specification and documentation of furniture and includes but is not limited to workstations, seating, tables, storage and shelving, filing, trash receptacles, clocks, framed artwork, artificial plants, and other accessories. Contract documentation is required to facilitate pricing, procurement and installation. The FF&E package is based on the furniture footprint developed in the Structural Interior Design (SID) portion of the interior design. Develop the FF&E package concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, J-boxes, communication outlets and connections, and lighting as appropriate. In addition, coordinate layout with other building features such as architectural elements, thermostats, location of TV's, GF/GI equipment (for example computers, printers, copiers, shredders, faxes), etc. Locate furniture in front of windows only if the top of the item falls below the window and unless otherwise noted, do not attach furniture including furniture systems to the building. If project has SIPRNET and/or NIPRNET, coordinate furniture layout with SIPRNET and NIPRNET separation requirements. Verify that access required by DOIM for SIPRNET box and conduit is provided. The DOR shall interview appropriate Government personnel to determine FF&E requirements for furniture and furnishings prior to preparation of the scheme to be presented. Determine FFE items and quantities by, but not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function, (3) room functions, (4) rank and grade. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

Design may proceed to final with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide unbound, electronic drawings in CAD and BIM. Provide all files needed to view complete drawings. Submit all text documents in Microsoft Word or Excel..

Submit four copies of the final and complete FF&E information and samples in 8 1/2" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 1/2". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

Design submittal requirements include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form

Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include:

- (a) Furniture item illustration and code
- (b) Furniture item name
- (c) Job name, location, and date
- (d) General Services Administration (GSA) FSC Group, part, and section
- (e) GSA Contract Number, Special Item Number (SIN), and contract expiration date
- (f) Manufacturer, Product name and Product model number or National Stock Number (NSN)
- (g) Finish name and number (code to finish samples)
- (h) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples)
- (i) Dimensions
- (j) Item location by room number and room name
- (k) Quantity per room
- (l) Total quantity
- (m) Special instructions for procurement ordering and/or installation (if applicable)
- (n) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to:
 - (1) required features and characteristics
 - (2) ergonomic requirements
 - (3) functional requirements
 - (4) testing requirements
 - (5) furniture style
 - (6) construction materials
 - (7) minimum warranty

The following is an example for "m" features and characteristics, ergonomic requirements and functional requirements:

Chair Description:

- (1) Mid-Back Ergonomic Task Chair
- (2) Pneumatic Gaslift; Five Star Base
- (3) Mesh Back; Upholstered Seat
- (4) Height and Width Adjustable Task Arms:
 - a. Arm Height: 6" - 11" (+-1/2")
 - b. Arm Width: 2" - 4" adjustment
- (5) Height Adjustable Lumbar Support
- (6) Adjustable Seat Height 16"-21" (+- 1")
- (7) Sliding Seat Depth Adjustment 15"-18" (+-1")
- (8) Standard Hard Casters (for carpeted areas)
- (9) Overall Measurements:
 - a. Overall width: 25" - 27"

- b. Overall depth: 25"– 28"
- (10) Must have a minimum of the following adjustments (In addition to the above):
 - a. 360 Degree Swivel
 - b. Knee-Tilt with Tilt Tension
 - c. Back angle
 - d. Forward Tilt
 - e. Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

- (1) Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)
- (2) Minimum noise reduction coefficient (NRC)
- (3) Minimum sound transfer coefficient (STC)
- (4) Minimum flame spread and smoke development
- (5) UL testing for task lighting and electrical system
- (6) Panel widths and heights and their locations (this may be done on the drawings) Worksurface types and sizes (this may be done on the drawings)
- (7) Worksurface edge type
- (8) Varying panel/cover finish materials and locations (locations may be shown on the drawings)
- (9) Storage requirements
- (10) Keyboard requirements
- (11) Lock and keying requirements
- (12) Accessory components (examples: tack boards, marker boards, paper management)
- (13) Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)
- (14) Locations of communication cables (base, beltline, below and/or above beltline, top channel)
- (15) Types of electrical outlets
- (16) Types of communication jacks; provided and installed by others
- (17) Locations of electrical outlets and communication jacks (this may be done on the drawings)
- (18) Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Manufacturer & Alternate Manufacturer List

Provide a table consisting of all the major furniture items in the order forms and two alternate manufacturers for each item. ALTERNATE MANUFACTURER ITEMS MUST BE SELECTED FROM GSA SCHEDULE AND MEET ALL THE SALIENT FEATURES OF THE ORIGINALLY SPECIFIED ITEM. Provide manufacturer name, address, telephone number, product series and product name for each item and the two alternate items. Major furniture items include, but are not limited to, casegoods, furniture systems, seating, and tables. Organize matrix by item code and item name.

1.1.4. FF&E Procurement List

Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc. Divide the FF&E package into different sections based on this listing, applies to order forms and cost estimates.

1.1.5. Points of Contact (POCs)

Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and email, include each contact's job function. Divide the FF&E package into different sections based on this listing, applies to order forms and cost estimates.

1.1.6. Color Boards

Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate

Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency, installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be used in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

Provide floor Plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. Key all the items on the drawings by furniture item code. Do not provide manufacturer specific information such as product names and numbers on drawings, Drawings shall be non-proprietary. This is typical for FFE on all plans, including those mentioned below.

1.2.2. Workstation Plans

Show each typical workstation configuration in plan view. In addition, provide either elevations or an isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Identify workstations using the same numbering system as shown on the project drawings. Key components to a legend on each sheet which identifies and describes the components along with dimensions. Provide the plan, elevations and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans

Show panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project), powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans

Provide typical free standing desk configurations in plan view. In addition, provide either elevation or an isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans

Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans

Show power provisions including type and locations of feeder components, activated outlets and other electrical components. Show locations and quantities of outlets for workstations. Clearly identify different outlets, i.e. electrical, LAN and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans

Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height.

1.2.8. Window Drapery Plans

Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material, drapery size and type, draw direction, location and quantities.

1.3. FURNITURE SELECTION

1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification for items not available on the GSA Schedules.

1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections, example: Steelcase, Turnstone, Brayton International, Metro, and Vecta are all Steelcase companies. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to make some selections from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specify modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.

1.4.2. Unless otherwise noted, specify workstations and storage of steel construction. Provide high pressure laminate worksurface tops constructed to prevent warpage (thermally fused worksurfaces are not acceptable). Provide user friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and worksurfaces are completely and smoothly finished. Provide abutting worksurfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level worksurface.

1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open.

1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.

1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 55,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions.

1.6. ACCESSORIES

1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage. Provide tackable surfaces at workstations with overhead storage.

1.6.2. Not Used.

1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under worksurface.

1.7. MISSION UNIQUE EQUIPMENT

Funding for FF&E furniture items and mission unique equipment (MUE) items are from two different sources. Separate the designs and procurement documentation for FFE items and MUE. MUE includes, but is not limited to, items such as commercial appliances, fitness equipment, IT equipment and supporting carts. The User will purchase and install mission unique equipment items, unless otherwise noted. Identify locations of known MUE items such as commercial appliances, etc. for space planning purposes.

1.8. SUSTAINABILITY

1.8.1. For all designs provided regardless of facility type, make every effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider: **Material Chemistry and Safety of Inputs** (What chemicals are used in the construction of the selections?); **Recyclability** (Do the selections contain recycled content?); **Disassembly** (Can the selections be disassembled at the end of their useful life to recycle their materials?).

1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry ([MBDC](#)) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "third-party" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General.

Where appropriate, design furniture systems in open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typicals and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Panels shall be capable of structurally supporting more than 1 fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical And Information/Technology (IT)

Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 10 00, paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation to workstation.

1.9.5. Pedestals

Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

1.10.1. Design for executive furniture in command areas, coordinate specific locations with Corps of Engineers Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood casegoods, seating and tables. Select executive furniture casegoods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.

1.10.2. Specify furniture with wood veneer finish with mitered solid wood edge of same wood type. Other executive office furniture such as seating, tables, executive conference room furniture, etc. shall be compatible in style, finish and color with executive furniture casegoods.

1.11. SEATING

1.11.1. General

Specify appropriate chair casters and glides for the floor finish where the seating is located. All task seating shall support up to a minimum of 250 lbs.

1.11.2. Desk and Guest Seating

Select ergonomic desk chairs with casters, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, pneumatic seat height adjustment, and padded, contoured upholstered seat and back. Desk and guest chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Depending on scale of desk chair provide seat pan forward and back adjustment to increase or decrease depth of seat pan. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16 1/2-20". Select guest chairs that are compatible in style, finish and color with the desk chairs.

1.11.3. Conference Room Seating

At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allows seating to be moved up closely to the table top. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish and color with conference seating at the tables.

1.11.4. Lounge, Waiting and Reception Area Seating

Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted.

1.11.5. Break Room Seating

Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required. Chairs shall have metal legs and composite materials for seats.

1.12. FILING AND STORAGE.

Select storage and shelving units that meet customer's functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy duty storage and shelving if information is not available.

1.13. TRAINING TABLES.

Training tables shall be reconfigurable, moveable and storable; lighter weight folding with dollies or casters as necessary. Plastic laminate self edges are unacceptable. Specify power and data requirements and dollies as required.

1.14. FURNITURE WARRANTIES.

Specify manufacturer's performance guarantees or warranties that include parts, labor and transportation as follows:

Furniture System, unless otherwise noted – 10 year minimum
 Furniture System Task Lights – 2 year minimum, excluding bulbs
 Furniture System Fabric – 3 year minimum
 Wood Desks - 10 year minimum

Metal Desks – 12 year minimum
 Seating, unless otherwise noted - 10 year minimum
 Seating Mechanisms and Pneumatic Cylinders - 10 years
 Seating Fabric - 3 years minimum
 Wood Filing and Storage - 10 year minimum

Tables, unless otherwise noted - 10 year minimum
 Table Mechanisms – 5 year minimum
 Table Ganging Device - 1 year minimum
 Items not listed above - 1 year minimum

ATTACHMENT C

TRACKING COMMENTS IN DRCHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government and Contractor reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate for the review conference exactly what action will be taken or why the action is not required. After the design review conference and prior to the next design submittal for the package, the DOR's will annotate those comments that require DOR action, design revision, etc. to show how and where it has been addressed in the design documents. This shall be part of the required design configuration management plan. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and resolved prior to the next submittal. Print and include the DrChecks comments and responses and included in the design analysis for record in the next design submittal for that package.

2.1. Upon review of comments prior to the design review conference, the DOR(s) shall identify whether they concur, non-concur, mark it "for information only" or mark it "check and resolve". Indicate exactly what action will be taken or why the action is not required.

2.2. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.

2.3. After the conference, the DOR(s) shall formally respond to each applicable comment in DrChecks a second time prior to the next submittal, clearly indicating what action was taken and what drawing/spec/design analysis changed. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next submittal, reviewers will back-check answers to the comments against the new submittal, in addition to reviewing additional design work.

2.4. Clearly annotate in DrChecks those comments that, in the DB Contractor's opinion, require effort outside the scope of the contract. Do not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at <http://www.projnet.org> and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Role

The Contractor is the technical reviewer and the Government is the compliance reviewer of the DB's design documents. Each reviewer enters their own comments into the Dr Checks system. To enter comments:

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

- 4.3. Click on the appropriate review conference. An Add comment screen will appear.
- 4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.
- 4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.
- 4.6. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

5.0 DrChecks Comment Evaluation (Step 1 of 2)

The role of the DOR(s) is to evaluate and respond to the comments entered by the Government's and DB Contractor's reviewers. To respond to comments:

- 5.1. Log into DrChecks.
- 5.2. Click on the appropriate project.
- 5.3. Under "Evaluate" click on the number under "Pending".
- 5.4. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)
- 5.5. Select the appropriate evaluation radio button (concur, non-concur, for information only, or check and resolve) and respond with a brief explanation in the Discussion field. An explanation other than to say "concur" is not necessary for "Concur", but may be useful for the Design Configuration Management purposes.
- 5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.
- 5.7. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then Logout.

6.0 DrChecks Comment Evaluation (Step 2 of 2)

This is where the DOR(s) respond to each applicable comment in DrChecks after the design review conference, prior to the next submittal, clearly indicating what action was taken and what drawing/spec/design analysis changed. Respond to the previous comments, following the same steps as above, adding the narrative in the discussion field.

7.0 DrChecks Back-Check

At the following design conference, (where applicable) or at some other agreed time, Government and Contractor reviewers will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and that all revisions have been completed. Reviewers shall either enter additional back-check comments, if necessary, or close those where actions are complete.

- 7.1. Log into DrChecks.
- 7.2. Click on the appropriate project.
- 7.3. Under "My Backcheck" click on the number under "Pending".
- 7.4. If you agree with the designer's response select "Close Comment" and add a closing response if desired.
- 7.5. If you do not agree with the designer's response or the submittal does not reflect the response given, select "Issue Open", enter additional information.

7.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

7.7. Once back-checks are all entered, exit DrChecks by choosing "My Account" and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

ATTACHMENT D
SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

Instructions: Use the information outlined in this document to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for all building projects. Additional and supplemental information may be used to further develop the code review. Insert N/A after criteria, which may be "not applicable".

1.0 SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

- 1.1. Project Name (insert name and location)
- 1.2. Applicable Codes and Standards
 - 1.2.1. Unified Facilities Criteria (UFC): 3-600-01, Design: Fire Protection Engineering For Facilities
 - 1.2.2. International Building Code (IBC) for fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements, except as modified by UFC 3-600-01.
 - 1.2.3. National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition), for building egress and life safety and applicable criteria in UFC 3-600-01.
 - 1.2.4. ADA and ABA Accessibility Guidelines. For Buildings and Facilities See Section 01 10 00, Paragraph 3 for facility specific criteria.
- 1.3. Occupancy Classification
IBC chapters 3 and 4
- 1.4. Construction Type
IBC chapter 6
- 1.5. Area Limitations
IBC chapter 5, table 503
- 1.6. Allowable Floor Areas
IBC section 503, 505
- 1.7. Allowable area increases
IBC section 506, 507
- 1.8. Maximum Height of Buildings
IBC section 504
- 1.9. Fire-resistive substitution
- 1.10. Occupancy Separations
IBC table 302.3.2
- 1.11. Fire Resistive Requirements
 - 1.11.1. Exterior Walls - [] hour rating, IBC table 601, 602
 - 1.11.2. Interior Bearing walls - [] hour rating
 - 1.11.3. Structural frame - [] hour rating
 - 1.11.4. Permanent partitions - [] hour rating

- 1.11.5. Shaft enclosures - [] hour rating
- 1.11.6. Floors & Floor-Ceilings - [] hour rating
- 1.11.7. Roofs and Roof Ceilings - [] hour rating
- 1.12. Automatic Sprinklers and others used to determine the need for automatic Extinguishing Equipment, Extinguishing Systems, Foam Systems, Standpipe
 - 1.12.1. UFC 3-600-01, chapters 4 and 6 systems, wet chemical systems, etc. State which systems are required and to what criteria they will be designed.
 - 1.12.2. UFC 3-600-01, Appendix B Occupancy Classification. Note the classification for each room. This may be accomplished by classifying the entire building and noting exceptions for rooms that differ (E.g. The entire building is Light Hazard except boiler room and storage rooms which are [], etc.)
 - 1.12.3. UFC 3-600-01, Chapter 3 Sprinkler Design Density, Sprinkler Design Area, Water Demand for Hose Streams (supply pressure and source requirements).
 - 1.12.4. UFC 3-600-01, Chapter 4 Coverage per sprinkler head. Extended coverage sprinkler heads are not permitted.
 - 1.12.5. Available Water Supply. Provide the results of the water flow tests showing the available water supply static pressure and residual pressure at flow. Based on this data and the estimated flow and pressure required for the sprinkler system, determine the need for a fire pump.
 - 1.12.6. NFPA 13, Para. 8.16.4.6.1. Provide backflow preventer valves as required by the local municipality, authority, or water purveyor. Provide a test valve located downstream of the backflow preventer for flow testing the backflow preventer at full system demand flow. Route the discharge to an appropriate location outside the building.
- 1.13. Kitchen Cooking Exhaust Equipment
Describe when kitchen cooking exhaust equipment is provided for the project. Type of extinguishing systems for the equipment should be provided. per NFPA 96. Show all interlocks with manual release switches, fuel shutoff valves, electrical shunt trips, exhaust fans, and building alarms.
- 1.14. Portable Fire Extinguishers, fire classification and travel distance. per NFPA 10
- 1.15. Enclosure Protection and Penetration Requirements. - Opening Protectives and Through Penetrations
 - 1.15.1. IBC Section 712, 715 and Table 715.3. Mechanical rooms, exit stairways, storage rooms, janitor [] hour rating. IBC Table 302.1.1
 - 1.15.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives
- 1.16. Fire Dampers. Describe where fire dampers and smoke dampers are to be used (IBC Section 716 and NFPA 90A). State whether isolation smoke dampers are required at the air handler.
- 1.17. Detection Alarm and Communication. UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72
- 1.18. Mass Notification. Describe building/facility mass notification system (UFC 4-021-01) type and type of base-wide mass notification/communication system. State whether the visible notification appliances will be combined with the fire alarm system or kept separate. (Note: Navy has taken position to combine visible notification appliances with fire alarm).
- 1.19. Interior Finishes (classification). NFPA 101.10.2.3 and NFPA 101.7.1.4
- 1.20. Means of Egress

- 1.20.1. Separation of Means of Egress, NFPA 101 chapters 7 and 12-42; NFPA101.7.1.3
- 1.20.2. Occupant Load, NFPA101.7.3.1 and chapters 12-42.
- 1.20.3. Egress Capacity (stairs, corridors, ramps and doors) NFPA101.7.3.3
- 1.20.4. Number of Means of Egress, NFPA101.7.4 and chapters 12-42.
- 1.20.5. Dead end limits and Common Path of Travel, NFPA 101.7.5.1.6 and chapters 12-42.
- 1.20.6. Accessible Means of Egress (for accessible buildings), NFPA101.7.5.4
- 1.20.7. Measurement of Travel Distance to Exits, NFPA101.7.6 and chapters 12-42.
- 1.20.8. Discharge from Exits, NFPA101.7.7.2
- 1.20.9. Illumination of Means of Egress, NFPA101.7.8
- 1.20.10. Emergency Lighting, NFPA101.7.9
- 1.20.11. Marking of Means of Egress, NFPA101.7.10
- 1.21. Elevators, UFC 3-600-01, Chapter 6; IBC and ASME A17.1 - 2000,(Safety Code for Elevators and Escalators)
- 1.22. Accessibility Requirements, ADA and ABA Accessibility Guidelines for Buildings and Facilities
- 1.23. Certification of Fire Protection and Life Safety Code Requirements. (Note: Edit the Fire team membership if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features for this project in accordance with the attached completed form(s).
- 1.24. Designer of Record. Certification of Fire protection and Life Safety Code Requirements. (Note: Edit the Fire team members if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features of this project.

Fire Protection Engineer of Record:

Signature and Stamp

Date

OR

Architect of Record:

Signature and Stamp

Date

Mechanical Engineer of Record:

Signature and Stamp

Date

Electrical Engineer of Record:

Signature/Date

ATTACHMENT E
LEED SUBMITTALS

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals (OCT09)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		FEATURE	DUE AT		DATE	REV
GENERAL						
		GENERAL - All calculations shall be in accordance with LEED 2009 Reference Guide.				
		GENERAL: Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb/EngineeringCriteria .				
		GENERAL - For all credits, narrative/comments may be added to describe special circumstances or considerations regarding the project's credit approach.				
		GENERAL - Include all required LEED drawings indicated below in contract drawings with applicable discipline drawings, labeled For Reference Only.				
		NOTE: Each submittal indicated with "****" differs from LEED certified project submittals by either having a different due date or being an added submittal not required by GBCI.				
		NOTE: Projects seeking LEED certification need only submit to GBCI whatever documentation is acceptable to GBCI (for example, licensed professional certifications). This checklist identifies what must be submitted to the Government for internal review purposes. Government review of LEED documentation in no way supercedes or modifies the requirements and rulings of GBCI for purposes of compliance with project requirement to obtain LEED certification.				
		GENERAL - Audit documentation may include but is not limited to what is indicated in this table.				
			Closeout	List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals. - OR - Statement confirming that no changes have been made since final design that effect final design submittal documents.		Proj Engr (PE)
CATEGORY 1 - SUSTAINABLE SITES						
SSPR1		Construction Activity Pollution Prevention (PREREQUISITE)	**Final Design	List of drawings and specifications that address the erosion control, particulate/dust control and sedimentation control measures to be implemented.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
SS1		Site Selection	Final Design	Statement confirming that project does not meet any of the prohibited criteria.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		CIV
SS2		Development Density & Community Connectivity	Final Design	Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius.		CIV
			Final Design	Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV
			Final Design	Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan.		CIV
SS3		Brownfield Redevelopment	Final Design	Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS4.1		Alternative Transportation: Public Transportation Access	Final Design	Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
			Final Design	Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
SS4.2		Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design	FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		CIV
			Final Design	List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		CIV
			Final Design	List of drawings that show the location(s) of shower/changing facilities and, if located outside the building, statement indicating distance from building entrance.		CIV

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PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
SS4.3		Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Final Design	Statement indicating which option for compliance applies. FTE calculation. Statement indicating total parking capacity of site.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV
			Final Design	Option 1: List of drawings and specification references that show location and number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
			Final Design	Option 1: Statement indicating quantity, make, model and manufacturer of low-emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
			Final Design	Option 2: Low-emission & fuel-efficient vehicle parking calculation.		CIV
			Final Design	Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
			Final Design	Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period.		CIV
			Closeout	Option 3: Construction product submittals indicating what was provided and confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
SS4.4		Alternative Transportation: Parking Capacity	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		CIV
			Final Design	Option 2: FTE calculation. Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		CIV
			Final Design	Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Narrative indicating number of spaces required and provided and describing infrastructure and support programs with description of project features to support them.		CIV
SS5.1		Site Development: Protect or Restore Habitat	**Final Design	Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each.		CIV
			**Final Design	Option 2: Percentage calculation of restored/preserved habitat to total site area. List of drawings and specification references that convey restoration planting requirements.		CIV
SS5.2		Site Development: Maximize Open Space	Final Design	Option 2: LEED site plan drawing delineating boundary of vegetated open space adjacent to building with areas of building footprint and designated open space noted.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS6.1		Stormwater Design: Quantity Control	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be implemented to prevent excessive stream velocities and erosion.		CIV
			Final Design	Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		CIV
SS6.2		Stormwater Design: Quality Control	Final Design	For non-structural controls, list all BMPs used and, for each, describe the function of the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall treated.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.1		Heat Island Effect: Non-Roof	**Final Design	LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage of reflective/shaded/open grid area.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV

Tuesday, August 14, 2011

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PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
SS7.2		Heat Island Effect: Roof	Final Design	Option 1: Percentage calculation indicating percentage of SRI compliant roof area. List of drawings and specification references that convey SRI requirements and roof slopes.		ARC
			Final Design	Option 1: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout	Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 1: Manufacturer published product data or certification confirming SRI		PE
			Final Design	Option 2: Percentage calculation indicating percentage of vegetated roof area.		ARC
			Final Design	Option 3: Combined reflective and green roof calculation.		ARC
			Final Design	Option 3: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout	Option 3: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 3: Manufacturer published product data or certification confirming SRI		PE
SS8		Light Pollution Reduction	Final Design	Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interior fixtures does not intersect non-opaque building envelope surfaces). - OR - List of drawings and specification references that show automatic lighting controls compliance with credit requirement.		ELEC
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC
			Final Design	Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building façade/landscape lighting).		ELEC
			Final Design	Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			Final Design	Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.		ELEC
			Final Design	Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design	Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design	Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
CATEGORY 2 – WATER EFFICIENCY						
WEPR1		Water Use Reduction: 20% Reduction	Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC

Tuesday, August 16, 2011

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PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Closeout	X Manufacturer published product data or certification confirming fixture water usage.		PE
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design	List of landscape plan drawings.		CIV
			Final Design	Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used, specific information about source and available quantity.		CIV
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1	Same as WE1.1		CIV
WE2		Innovative Wastewater Technologies	Final Design	Statement confirming which option for compliance applies.		MEC
			Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design	Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design	Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design	Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site.		MEC
			Final Design	Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		CIV
			Final Design	Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources.		CIV
			Final Design	Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage conveyance reduction.		MEC
			Final Design	Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated wastewater usage.		MEC
WE3		Water Use Reduction: 30% - 40% Reduction	Same as WEPR1	Same as WEPR1		MEC

CATEGORY 3 – ENERGY AND ATMOSPHERE

Tuesday, August 16, 2011

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PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design	**Owner's Project Requirements document		ALL
			**Final Design	**Basis of Design document for commissioned systems		MEC, ELEC
			**Final Design	**Commissioning Plan		MEC, ELEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout	Commissioning Report		PE
EAPR2		Minimum Energy Performance (PREREQUISITE)	Final Design	Statement listing the mandatory provisions of ASHRAE 90.1 that project meets relative to compliance with this prerequisite and indicating which compliance path was used.		MEC ELEC ARC
			Final Design	Statement indicating which compliance path option applies.		MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies.		MEC
			Final Design	Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		MEC
EA1		Optimize Energy Performance	Final Design	Statement indicating which compliance path option applies.		MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features	MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)	MEC
EA2.1		On-Site Renewable Energy	Final Design	Statement indicating which compliance path option applies.	ELEC
			Final Design	List all on-site renewable energy sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost. Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.	ELEC MEC
			Final Design	Option 1: Indicate, for renewable energy, proposed design total annual energy generated and annual cost.	ELEC MEC
			Final Design	Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost, annual electric energy use and cost, annual non-electric fuel use and cost.	ELEC MEC
			Final Design	Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.	ELEC MEC
EA2.2		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1	ELEC MEC
EA2.3		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1	ELEC MEC
EA3		Enhanced Commissioning	**Final Design	**Owner's Project Requirements document (OPR)	ALL
			**Final Design	**Basis of Design document for commissioned systems (BOD)	ELEC MEC
			**Final Design	**Commissioning Plan	ELEC MEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.	PE
			Closeout	**Commissioning Report	PE
			**Final Design	Statement by CxA confirming Commissioning Design Review	
			Closeout	Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD	PE
			Closeout	**Systems Manual	PE
			Closeout	Statement by CxA confirming completion of O&M staff and occupant training	PE
			Closeout	**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues	PE
			**Predesign	Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.	MEC
EA4		Enhanced Refrigerant Management	Final Design	Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2009 Reference Guide Example Calculations	MEC
			Final Design	Narrative describing any special circumstances or explanatory remarks	
			Closeout	X Cut sheets highlighting refrigerant data for all HVAC components.	PE
EA5		Measurement & Verification	Closeout	Statement indicating which compliance path option applies.	PE
			Closeout	Measurement and Verification Plan including Corrective Action Plan	PE
			Closeout	**Scope of work for post-occupancy implementation of M&V plan including corrective action plan.	PE
EA6		Green Power	Closeout	Statement indicating which compliance path option applies.	PE
			Closeout	Option 1: Indicate proposed design total annual electric energy usage	PE
			Closeout	Option 2: Indicate actual total annual electric energy usage	PE
			Closeout	Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use	PE

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			Closeout	Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power		PE
			Closeout	Narrative describing how Green Power or Green Tags are purchased		PE
CATEGORY 4 – MATERIALS AND RESOURCES						
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design	Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MR1.1		Building Reuse: Maintain 55% of Existing Walls, Floors & Roof	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		ARC
MR1.2		Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.4		Building Reuse: Maintain 50% of Interior Non-Structural Elements	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		ARC
MR2.1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction	Waste Management Plan		PE
			**Construction Quarterly and Closeout	Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
			**Construction Quarterly and Closeout	Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1	Same as MR2.1		PE
MR3.1		Materials Reuse: 5%	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10%	Same as MR3.1	Same as MR3.1		PE
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, pre-consumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1	Same as MR4.1		PE
MR5.1		Regional Materials: 10% Extracted, Processed & Manufactured Regionally	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance, manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
			Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

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MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1		Same as MR5.1		PE	
MR6		Rapidly Renewable Materials	Closeout		Statement indicating total materials value and whether default or actual.		PE	
			Closeout		Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.		PE	
			Final Design		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		ARC	
			Closeout	X	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		PE	
MR7		Certified Wood	Closeout		Statement indicating total materials value and whether default or actual.		PE	
			Closeout		Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.		PE	
			Final Design or NLT Preconstruction		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE	
			Closeout	X	Vendor invoices, FSC chain of custody certificates and anufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.		PE	
INDOOR ENVIRONMENTAL QUALITY								
EQPR1		Minimum IAQ Performance (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		MEC	
			Final Design		Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.		MEC	
EQPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		ARC	
			Final Design		List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		ARC	
EQ1		Outdoor Air Delivery Monitoring	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC	
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		MEC	
			Final Design		Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.		MEC	
			Closeout	X	Cut sheets for CO2 monitoring system.		PE	
EQ2		Increased Ventilation	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC	
			Final Design		Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.		MEC	
			Final Design		Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.		MEC	
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		MEC	
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction		Construction IAQ Management Plan		PE	
			Closeout		Statement confirming whether air handling units were operated during construction		PE	
			Closeout		Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.		PE	

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			Closeout	Spreadsheet indicating, for each filter installed during construction, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.		PE
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction	Construction IAQ Management Plan		PE
			Closeout	Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements.		PE
			Closeout	Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 1b: Narrative describing the project's pre-occupancy and post-occupancy flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 2: Narrative describing the project's IAQ testing process, including specifics about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout	Option 2: IAQ testing report demonstrating compliance.		PE
EQ4.1		Low Emitting Materials: Adhesives & Sealants	Closeout	Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor aerosol adhesives were used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.2		Low Emitting Materials: Paints & Coatings	Closeout	Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor anti-corrosive/anti-rust paints were used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.3		Low Emitting Materials: Flooring Systems	Closeout	Spreadsheet indicating, for each indoor flooring system used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		PE
			Closeout	Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data - OR - Statement confirming no indoor carpet cushion was used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material compliance label in spreadsheet		PE
EQ4.4		Low Emitting Materials: Composite Wood & Agrifiber Products	Closeout	Spreadsheet indicating, for each indoor composite wood and agrifiber product used, the manufacturer, product name/model number, if it contains added urea formaldehyde (yes/no) and source of LEED compliance data.		PE
			Closeout	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		PE
EQ5		Indoor Chemical & Pollutant Source Control	Closeout	Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system.		PE
			Final Design	List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			Final Design	Spreadsheet indicating, for each chemical use area, the room number, room name, description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming that project includes no chemical use areas and that no hazardous cleaning materials are needed for building maintenance.		ARC MEC
			Final Design	If project includes chemical use areas: List of drawing and specification references that convey locations of chemical use areas, room separation features and exhaust system.		ARC

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			Final Design	If project includes places where water and chemical concentrate mixing occurs: List of drawing and specification references that convey provisions for containment of hazardous liquid wastes OR - Statement confirming that project includes no places where water and chemical concentrate mixing occurs.		ARC MEC
			Closeout	If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.		PE
EQ6.1		Controllability of Systems: Lighting	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.		ELEC
			Final Design	For each shared multi-occupant space, provide a brief description of lighting controls.		ELEC
			Final Design	Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.		ELEC
EQ6.2		Controllability of Systems: Thermal Comfort	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with individual thermal comfort controls.		MEC
			Final Design	For each shared multi-occupant space, provide a brief description of thermal comfort controls.		MEC
			Final Design	Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.		MEC
EQ7.1		Thermal Comfort: Design	Final Design	Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and maximum indoor space design humidity.		MEC
			Final Design	Narrative describing method used to establish thermal comfort control conditions and how systems design addresses the design criteria, including compliance with the referenced standard.		MEC
EQ7.2		Thermal Comfort: Verification	Final Design	Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		MEC
			Final Design	List of drawing and specification references that convey permanent monitoring system.		MEC
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design	Option 2: Table indicating all regularly occupied spaces with space area and space area with compliant daylight zone. Sum of regularly occupied areas and regularly occupied areas with compliant daylight zone. Percentage calculation of areas with compliant daylight zone to total regularly occupied areas.		ARC
			Final Design	Option 1: Simulation model method, software and output data		ELEC
			Final Design	Option 1: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.		ELEC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	List of drawing and specification references that convey exterior glazed opening head and sill heights, glazing performance properties and glare control/sunlight redirection devices.		ARC
			Closeout	Manufacturer published product data or certification confirming glazing Tvis in spreadsheet		PE
EQ8.2		Daylight & Views: Views for 90% of Spaces	Final Design	Table indicating all regularly occupied spaces with space area and space area with access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.		ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey exterior glazed opening head and sill heights.		ARC
INNOVATION & DESIGN PROCESS						

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IDc1.1		Innovation in Design	Final Design		Narrative describing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
IDc1.2		Innovation in Design	Final Design				
IDc1.3		Innovation in Design	Final Design				
IDc1.4		Innovation in Design	Final Design				
IDc2		LEED Accredited Professional	Final Design		Narrative indicating name of LEED AP, company name of LEED AP, description of LEED AP's role and responsibilities in the project.		ARC

ATTACHMENT F
Version 05-31-2011

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - General

- 1.1. Definitions. See Section 7 for definitions of terms used in this document.
- 1.2. Submittal Format
 - 1.2.1. The Model shall be developed using Building Information Modeling ("BIM") supplemented with Computer Aided Design ("CAD") content as necessary to produce a complete set of Construction Documents. Printed design submittal drawings shall be 22 x 34 size, suitable for half-size scaled reproduction.
 - 1.2.2. BIM submittals shall conform to the requirements of Sections 3 and 4 below.
 - 1.2.3. For each Center of Standardization (CoS) facility type included in this Project, all Models and associated Facility Data shall be submitted in Bentley V8. The submittals shall be fully operable, compatible, and editable within the native BIM tools.

2.0 Section 2 – Design Requirements

- 2.1. Use of BIM for Design. Contractor shall use BIM application(s) and software(s) to develop Project designs consistent with the following requirements.
 - 2.1.1. Baseline Model. The Contractor will not be provided a baseline multi-discipline BIM Project Model.
 - 2.1.2. USACE BIM Workspace. The USACE Bentley BIM Workspace [Not Supplied - SubmittalReqCADDSystem : USACE_WORKSPACE_VERSION] must be used and can be downloaded from the CAD/BIM Technology Center website, currently <https://cadbim.usace.army.mil>.
 - 2.1.3. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.
 - 2.1.4. Industry Foundation Class (IFC) Support. The Contractor's selected BIM application(s) and software(s) must be consistent with the current IFC property sets. Any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment must be submitted for Government acceptance.
 - 2.1.5. BIM Project Execution Plan.
 - 2.1.5.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM uses, analysis technologies and workflows.
 - 2.1.5.2. Contractors shall utilize the link for the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template located in Attachment H to develop an acceptable Plan.
- 2.2. BIM Requirements.
 - 2.2.1. Facility Data. Develop the Facility Data to include material definitions and attributes that are necessary for the Project facility design and construction as described in Section 4.0. Additional data in support of Section 6.0 Contractor Electives is encouraged to be added to the Model.
 - 2.2.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.3. Model Granularity. Individual elements may vary in level of detail within the Model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g., at least 1/16th, 1/8th and 1/4th), or on appropriately scaled civil drawings.

2.3. Output. Submitted Drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) from the Model and Facility Data. Drawings derived from the Model shall remain connected to the Model for the life of the Project and documented in the PxP. Drawings not derived from the Model shall also be documented in the PxP.

2.3.1. Drawings derived from the Model shall be compliant with the A/E/C CAD Standard. Deliver electronic CAD files used for the creation of the Construction Documents per requirements in Section 01 33 16, the criteria of the USACE Fort Worth District, and as noted herein.

2.3.2. The CAD file format specified for drawings shall not dictate which application(s) are used for development and execution of the Model and Facility Data. Application(s) used shall be documented in the PxP.

2.4. Quality Control Parameters. Implement quality control ("QC") parameters for the Model, including:

2.4.1. Model Standards Checks. QC validation ensures that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Identify and report non-compliant elements and submit a corrective action plan. Provide the Government with detailed justification and request Government acceptance for any non-compliant element that the Contractor proposes to be allowed to remain in the Model.

2.4.2. CAD Standards Checks. QC checking ensures that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per requirements in Section 01 33 16. Identify and report non-compliant content and submit a corrective action plan.

2.4.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for acceptance.

2.5. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.5.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.5.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural, or mechanical vs. mechanical, overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation, code space requirements) in a written report and resolve.

2.5.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.5.4. Other Parameters. Develop other design and construction review parameters as the Contractor deems appropriate for the Project and provide to the Government for acceptance.

3.0 Section 3 – Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with the PxP deliverables at stages as described below.

3.1.2. For each Interim Design Submittal as set forth in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.4 and 2.5 above have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Interim Design Submittal as set forth in Paragraphs 3.3 through 3.6, provide the Government with:

3.1.3.1. The Model, Facility Data, Workspace and CAD Data files in the native BIM/CAD format.

3.1.3.2. A copy of the Model in an interactive review format such as Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per PxP requirements. The format for reviews can change between submittals.

3.1.3.3. A list of all submitted electronic files including a description, directory, and file name for each file submitted. For all CAD printed sheets, include a list of the sheet titles and sheet numbers. Identify which files have been produced from the Model and Facility Data.

3.1.4. The Government shall confirm acceptability of all submittals identified in Section 3 in coordination with the USACE Geographic District BIM Manager.

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the PxP where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated into the PxP.

3.2.2. Within thirty (30) days after the acceptance of the PxP, conduct a demonstration to review the Plan for clarification, and to verify the functionality of planned Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the PxP performing a subsequent demonstration for Government acceptance. There will be no payment for design or construction until the PxP is completed and accepted by the Government. The Government may also withhold payment if there is design and construction for unacceptable performance in executing the accepted PxP.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. Submit the Model with Facility Data per the requirements identified in Paragraphs 2.2 and 2.3 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. Submit the Model with Facility Data per the requirements identified in Paragraphs 2.2 and 2.3. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Built BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built construction conditions for Government acceptance, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The Model shall be developed to include the systems described below as they would be built, the processes of installing them, and to reflect final as-built construction conditions. The deliverable Model at the Interim Design Stage and at the Final Design Stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining actual net square footage and net volume, and holding data to develop the room finish schedule including room names and numbers. Include program information to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab(s) shall be developed in the Structural Model and then referenced by the Architectural Model.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and millwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations, sections and schedules in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture. The furniture Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.

4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.

4.4. Equipment. The Model may vary in level of detail for individual elements. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and schedules, indicating the configuration, materials, finishes, mechanical, and electrical requirements.. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.

4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.5. Structural. The Structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

- 4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.
- 4.5.2. Floor Slabs. Structural floor slabs shall be depicted with all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.
- 4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans, related building/wall sections, and schedules.
- 4.5.4. Cast-in-Place Concrete. All walls, columns, beams, including necessary intelligence to produce accurate plans and building/wall sections, depicting cast-in-place concrete elements.
- 4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.
- 4.5.6. Stairs. All framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.
- 4.5.7. Shafts and Pits. All shafts and pits, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.
- 4.5.8. Openings and Penetrations. All major openings and penetrations that would be included on a quarter inch (1/4"=1'0") scaled drawing.
- 4.6. Mechanical. The Mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required to be depicted in the Model. Additional minimum Model requirements include:
- 4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution for supply, return, ventilation and exhaust ducts, control systems, registers, diffusers, grills, and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.
- 4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.
- 4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.
- 4.6.3. Equipment Clearances. All Mechanical equipment clearances shall be modeled for use in interference management and maintenance access requirements.
- 4.6.4. Elevator Equipment. All necessary equipment and control systems, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.
- 4.7. Electrical/Telecommunications. The Electrical and Telecommunications systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required to be depicted in the Model. Additional minimum Model requirements include:
- 4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical. All necessary special electrical components (i.e., security, mass notification, public address, nurse call and other special electrical occupancy sensors, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, and bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Telecommunications. All existing and new telecommunications service controls and connections, both above ground and underground, with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting including all lighting fixtures, relevant existing and proposed support utility lines and equipment with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. All Electrical equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The Civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles .

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways, parking lots, and parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

- 6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit, as described in the proposal submission requirements and evaluation criteria, the requirements of paragraphs 6.2 through 6.5 are as applicable for those elective feature(s) that will be included in the project.
- 6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements on the Whole Building Design Guide website (www.wbdg.org), including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate records that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.
- 6.3. Project Scheduling using the Model. In the PxP and during the Initial Design Conference Submittal Demonstration, provide an overview of the use of BIM in the development and support of the Project construction schedule.
- 6.3.1. Submittal Requirements. During the Stages identified in Paragraphs 3.3 through 3.6, the Contractor shall deliver the construction schedule derived from the Model.
- 6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for Project scheduling.
- 6.4. Cost Estimating. In the PxP and during the Initial Design Conference Submittal Demonstration, provide an overview of the use of BIM in the development and support of cost estimating, or other costing applications such as comparative cost analysis for proposed changes and estimate validation.
- 6.4.1. Submittal Requirements. During the Stages identified in Paragraphs 3.3 through 3.6, the Contractor shall deliver cost estimating information derived from the Model.
- 6.4.2. Project Completion. At Project completion, the Contractor shall provide an Micro Computer Aided Cost Estimating System Generation II ("MII") Cost Estimate that follows the USACE Cost Engineering Military Work Breakdown System ("WBS"), a modified Unifomat, to at least the sub-systems level and uses quantity information supplied directly from Model output to the maximum extent possible, though other "gap" quantity information will be included by the contractor as necessary for a complete and accurate Cost Estimate. (See Paragraph 6.4.2.2).
- 6.4.2.1. Sub system level extracted quantities from the Model for use within the Estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. When developing a Model, the contractor shall be cognizant of construction sequencing at the beginning stages of Model development, such as recognizing tasks performed on the first floor versus the same task on higher floors that will be more labor intensive and, therefore, need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the Model shall be broken down by their location (proximity in the structure) as well as the complexity of installation.
- 6.4.2.2. At all design Stages it shall be acknowledged that BIM output will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the Project based on the design alone. (An example of this would be plumbing that is less than 1.5" diameter and, therefore, not expected to be modeled due to permitted level of design granularity; this information is commonly referred to as "The Gap". Quantities addressing "The Gap" and their associated costs shall be included in the final Project actual Cost Estimates as well even though not derived directly from the Model data).
- 6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing and other analyses that may be generated from the Model or reports summarizing the data compiled from these analyses shall be submitted in the form established by contractor in its accepted PxP.

7.0 Definitions

- 7.1. The following definitions apply specifically in the context of this attachment only.

7.2. “Model”: An electronic, three-dimensional representation of facility elements with associated intelligent attribute data (“Facility Data”).

7.3. “Facility Data”: The non-graphical information attached to objects in the Model that defines various characteristics of the object. Facility Data can include properties such as parametric values that drive physical sizes, material definitions and characteristics (e.g. wood, metal), manufacturer data, industry standards (e.g. AISC steel properties), and project identification numbers. Facility Data can also define supplementary physical entities that are not shown graphically in the Model, such as insulation around a duct, or hardware on a door.

7.4. “Workspace”: A collection of content libraries and supporting files that define and embody a BIM standard. A workspace includes BIM libraries such as wall types, standard steel shapes, furniture, HVAC fittings, and sprinkler heads. It also contains sheet libraries such as print/plot configurations, font and text style libraries, and sheet borders and title blocks. The USACE has developed Workspaces specific to USACE BIM standards; these workspaces are dependent on specific versions of the BIM applications they serve. All USACE BIM Workspaces can be downloaded from the CAD/BIM Technology Center (<https://cadbim.usace.army.mil>). In some cases, there is a specific Workspace for a given CoS Facility Standard Design.

7.5. “IFC”: Industry Foundation Class, a standard and file format used for the exchange of BIM data; see www.iai-tech.org. Note: In the context of this attachment, IFC does not mean “Issued For Construction.”

ATTACHMENT G**DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT**

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	

ATTACHMENT H
USACE BIM Project Execution Plan (PxP) Template Version 1.0

This template is a tool that is provided to assist in the development of a USACE BIM Project Execution Plan as required per contract. The template provides a standard format for organizations to establish their general means and methods for meeting the scope and deliverable requirements in Attachment F. It was adapted from the buildingSMART alliance™ (bSa) Project “BIM Project Execution Planning” as developed by The Computer Integrated Construction (CIC) Research Group of The Pennsylvania State University. The bSa project is sponsored by The Charles Pankow Foundation, Construction Industry Institute (CII), Penn State Office of Physical Plant (OPP), and The Partnership for Achieving Construction Excellence (PACE). The template can be found at the following link:

https://mrsi.usace.army.mil/rfp/Shared%20Documents/USACE_BIM_PXP_TEMPLATE_V1.0.pdf

Please note: Instructions and examples to assist with the completion of this template are currently in grey. The text can and should be modified to suit the needs of the organization filling out the template. If modified, the format of the text should be changed to match the rest of the document. This can be completed, in most cases, by selecting the normal style in the template styles.

**SECTION 01 45 04.00 10
CONTRACTOR QUALITY CONTROL**

1.0 GENERAL

1.1. REFERENCES

1.2. PAYMENT

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. QUALITY CONTROL PLAN

3.3. COORDINATION MEETING

3.4. QUALITY CONTROL ORGANIZATION

3.5. SUBMITTALS AND DELIVERABLES

3.6. CONTROL

3.7. TESTS

3.8. COMPLETION INSPECTION

3.9. DOCUMENTATION

3.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies
Engaged in the Testing and/or Inspection
of Soil and Rock as Used in Engineering
Design and Construction
- ASTM E 329 Agencies Engaged in the Testing
and/or Inspection of Materials Used in
Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)
ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager at the site, responsible for the overall site activities, including but not limited to quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site. Different contractors have different names for the on-site overall project supervisor. For clarification, the term "site project superintendent" refers to the Contractor's senior site representative or "on-site manager", or other similar title, as those terms are used in contract Clause 52.236-7, "Superintendence by the Contractor" and in the Division 00 Section(s) of the solicitation for this contract or task order, or elsewhere in the contract. It does not refer to a construction superintendent, unless that person is also the Contractor's permanently assigned senior site representative in charge of all on-site activities.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of

work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.

3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.

3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.

3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.

3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

3.2.1.8. Reporting procedures, including proposed reporting formats.

3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.

3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and

provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.

3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.2.4. Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. Include the DCM plan as a subset of the DQC Plan. See Section 'Design After Award'.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. . The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office

space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

3.4.3. CQC Personnel

3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.

3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; **are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility**; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. **One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:**

3.4.4. Experience Matrix

3.4.4.1. Area Qualifications

3.4.4.1.1. Civil - Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.

3.4.4.1.2. Mechanical - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.

3.4.4.1.3. Electrical - Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.

3.4.4.1.4. Structural - Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.

3.4.4.1.5. Plumbing - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.

- 3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area
- 3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).
- 3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)
- 3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).
- 3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at Seattle District - periodically offered at Association of General Contractors of Washington Education Foundation (www.constructionfoundation.agcwa.com). Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 **SUBMITTAL PROCEDURES**. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.

3.6.1.2. A review of the contract drawings.

3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.6.1.10. Discussion of the initial control phase.

3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4. Resolve all differences.

3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.

3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.

3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.

3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3. Check test instrument calibration data against certified standards.

3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2. Testing Laboratories

3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of \$1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

- For delivery by mail:
US Army Corps of Engineers
Materials Testing Center
3909 Halls Ferry Road
Vicksburg, MS 39180 - 61333
- For other deliveries:
US Army Corps of Engineers
Lou Feller
Building 2015, 3rd Floor
Fort Lewis, WA 98433 - 9500

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:

- 3.9.1.1. Contractor/subcontractor and their area of responsibility.
 - 3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.
 - 3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
 - 3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.
 - 3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
 - 3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
 - 3.9.1.7. Offsite surveillance activities, including actions taken.
 - 3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
 - 3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.
 - 3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.
- 3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

**SECTION 01 50 02.TBD
TEMPORARY CONSTRUCTION FACILITIES**

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.6. GOVERNMENT FIELD OFFICE

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 50 02 apply to this task order, except as otherwise specified herein.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board (As Specified in Base contract)

1.3.2. Project and Safety Signs (Added to Stress standardization of signs, in the event that the Base ID/IQ Section 01 50 02 does not contain this information)

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try <http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf>.

1.6. GOVERNMENT FIELD OFFICE

1.6.1. Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 1,200 square feet in floor area, co-located on the project site with the Contractor's office and providing space heat, air conditioning, electric light and power, power and communications outlets and toilet facilities consisting of at least one lavatory and at least one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide outlets for 20 government phones and same number of LAN connections for Government computers. Coordinate with the Resident Engineer for locations. Provide a conference room with space large enough for 12 personnel to hold meetings. Provide a minimum of two outlets per government work station and at least one outlet per 10 feet of wall space for other government equipment. Provide at least twice weekly janitorial service. Remove the office facilities upon completion of the work and restore those areas. Connect and disconnect utilities in accordance with local codes and to the satisfaction of the Contracting Officer.

1.6.2. Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds, per EM 385-1-1.

End of Section 01 50 02.TBD

APPENDIX A – Geotechnical Information

PREPARED FOR

TETRATECH, INC.

January 26, 2011
REVISED February 18, 2011



Scott S. Riegel, L.G.
Senior Project Geologist

FOR: 

Raymond A. Coglas, P.E.
Principal



Kyle R. Campbell, P.E.
Principal

GEOTECHNICAL ENGINEERING STUDY
REGIONAL LOGISTIC SUPPORT
CENTER (RLSC) SITE
FORT LEWIS, WASHINGTON

ES-1711.03

Earth Solutions NW, LLC
1805 - 136TH Place Northeast, Suite 201
Bellevue, Washington 98005
Phone: 425-449-4704 Fax: 425-449-4711
Toll Free: 866-336-8710



January 26, 2011
Revised February 18, 2011
ES-1711.03

Earth Solutions NW LLC

- Geotechnical Engineering
- Construction Monitoring
- Environmental Sciences

TetraTech, Inc.
1736 Fourth Avenue South, Suite A
Seattle, Washington 98134-1502

Attention: Mr. Bruce Johnson

Dear Mr. Johnson:

Earth Solutions NW, LLC (ESNW) is pleased to present this report titled "Geotechnical Engineering Study, Regional Logistic Support Center (RLSC) Site, Fort Lewis, Washington".

This study presents the results of additional subsurface explorations and visual reconnaissance conducted by ESNW representatives subsequent to design changes made to site layout and configuration. Subsurface explorations consisted of excavating 31 additional test pits across accessible portions of the development envelope not previously explored during preparation of report ES-1711.01 dated September 15, 2010.

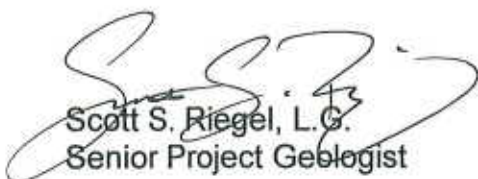
Based on the conditions encountered during our fieldwork, the site is underlain primarily by native soils consisting of surficial topsoil transitioning to sand and gravel glacial outwash deposits. Isolated areas of fill are present, located primarily along existing roadway alignments.

Based on the results of our study, the proposed buildings can be supported on conventional foundation systems bearing on undisturbed, competent or recompacted native soil or structural fill. Where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, compaction of the soils to the specifications of structural fill, or overexcavation and replacement with a suitable structural fill would be necessary.

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding the content of this geotechnical engineering study, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC



Scott S. Riegel, L.G.
Senior Project Geologist

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**GEOTECHNICAL ENGINEERING STUDY
REGIONAL LOGISTIC SUPPORT CENTER (RLSC) SITE
FORT LEWIS, WASHINGTON**

ES-1711.03

INTRODUCTION

General

This geotechnical engineering study was prepared for the Regional Logistic Support Center (RLSC) to be constructed off the northwestern corner of the intersection between Rainier Drive and Tacoma Drive within the Fort Lewis Army Base in Pierce County, Washington. The purpose of this study was to conduct additional site explorations in areas not previously explored and prepare updated geotechnical recommendations for the proposed development. Our scope of services for completing this geotechnical engineering study addressed the following:

- Excavating a total of 31 additional test pits across accessible portions of the revised project envelope not previously explored;
- Conducting a visual site evaluation of surface features related to geotechnical aspects of the project;
- Conducting engineering analyses, and;
- Preparation of this report.

The following documents and/or resources were reviewed as part of this report preparation:

- Overall Site Plan, Sheet CS-100, dated January 14, 2011 provided by TetraTech, Inc.;
- Pierce County USDA Soil Conservation Survey (SCS), and;
- Geologic Map of Washington, Southwest Quadrant, Map GM-34.

Project Description

We understand the subject site will be developed with a variety of building types and associated improvements. Final site layout and grading plans are being developed; however we understand the project will be completed in four phases and will include construction of five main structures designated XLTEMF 1 and 2, Warehouse, Administrative Facility and Training Facility, as indicated on the referenced RLSC site plan provided by TetraTech, Inc. The warehouse structure will have a footprint of about 120,000 square feet and will likely include high-clearance ceilings. The remaining structures will be one to two stories in height.

TetraTech, Inc.
January 26, 2011
Revised February 18, 2011

Based on the existing topography, grading will be relatively minimal, and will likely require cuts and fills of less than approximately ten feet to achieve finish floor elevations.

Stormwater generated from site impervious surfaces will be directed to an infiltration drainage system located primarily along the southwest corner of the project site. The drainage system will infiltrate surface runoff into the underlying, native soil. Smaller infiltration facilities may be constructed at other locations across the site depending on final site designs.

The remainder of the site will be developed with general landscaping and paved parking and walkways. Total paved areas will be on the order of 20-30 acres.

If the above design assumptions are incorrect or change, ESNW should be contacted to review the recommendations in this report. ESNW should review the final design to verify that our geotechnical recommendations have been incorporated.

SITE CONDITIONS

Surface

The overall site is located in the northwestern corner of the intersection between Rainier Drive and Tacoma Drive in Fort Lewis JBLM, Pierce County, Washington (see Vicinity Map, Plate 1). The project area is irregular in shape and is bordered to the north by Interstate 5, to the south by developed Fort Lewis Base improvements, to the east by Rainier Drive and to the west by Jackson Avenue. The overall site topography is relatively level to slightly undulating, with less than about ten feet of total elevation change. Several gravel-surfaced roads cross the site. Areas not currently developed are vegetated with field grass and/or forest.

A water well pump station and a groundwater remediation system are located in the central portion of the project site. Both systems are located just off the east side of the Perry Avenue alignment. We understand the water well has been decommissioned and based on the conceptual site plan, the groundwater remediation system will either be decommissioned or moved.

Subsurface

An ESNW representative observed, logged and sampled 31 additional test pits excavated by a trackhoe and operator retained by ESNW for purposes of characterizing and classifying the soil and groundwater conditions in areas previously unexplored. The approximate locations of the test pits are depicted on the Test Pit Location Plan (Plate 2). Test pit logs from previous explorations and the most current phase of the project are included in Appendix A. Please refer to the test pit logs provided in Appendix A for a more detailed description of the subsurface conditions.

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January 26, 2011
Revised February 18, 2011

Fill

Fill was encountered at isolated test pit locations and was generally less than five to six feet deep. Fill may be encountered in excavations near existing roadway and utility improvements.

Topsoil

In areas not currently developed, topsoil was observed ranging in depths from between about 6 inches to about 18 inches. Topsoil is not suitable for foundation support, nor is it suitable for use as structural fill. Topsoil can be used in non-structural areas if desired.

Native Soil

Underlying the topsoil, medium dense sand with gravel and gravel with sand soils (Unified Soil Classification SP, SP-SM, GP, GP-GM and GW) were encountered extending to the maximum exploration depths of ten feet. The sand and gravel deposits exhibited a layered condition and gradational contacts consistent with seasonal hydraulic flow regimes.

Geologic Setting

The referenced geologic map identifies recessional outwash soil (Qgog) deposits throughout the site and surrounding areas.

The referenced Soil Survey does not provide soil mapping for this area. However, surrounding areas are mapped as Spanaway gravelly sandy loam, map designation 41A. This soil formed in glacial outwash and contains gravelly sand below approximately 60 inches.

The soil conditions encountered during our fieldwork were generally consistent with the geologic and soil survey designations. In general, the site is underlain by a thin layer of organic-rich topsoil transitioning to recessional outwash sand and gravel deposits.

Groundwater

We do not anticipate heavy groundwater seepage in the majority of the site excavations, except possibly in deeper utility excavations or where the contact between outwash and underlying glacial till is exposed. Groundwater seepage rates and elevations fluctuate depending on many factors, including precipitation duration and intensity, the time of year, and soil conditions. In general, groundwater flow rates are higher during the wetter, winter months.

Laboratory Testing

Representative samples were collected in the field for laboratory analyses in our main facility. Moisture contents were obtained for all samples collected and USDA and USCS sieve analyses were conducted on targeted samples. Laboratory test results are provided in Appendix B of this study. Moisture content data are provided on the test pit logs. Samples will be discarded after a period of 60 days following completion of this study, unless notified otherwise by the client.

INFILTRATION EVALUATION

Based on our understanding of the proposed infiltration facilities, there will be a series of infiltration trenches along the northern project envelope. Smaller systems such as swales or bio-retention systems may also be used at various locations across the site. We anticipate the facility bottoms will be located within the relatively free-draining native gravel deposits encountered below depths of approximately three feet relative to existing grades.

Infiltration Recommendations

Based on the results of the textural analyses collected during our fieldwork, in our opinion infiltration of stormwater at the subject site is feasible. In accordance with Table 6.3 of the Pierce County Stormwater Management and Site Development Manual, a design infiltration rate of 2.0 minutes per inch can be assigned to the majority of the site soils (clean gravel and sand). The allowable design infiltration rate includes a factor-of-safety reduction of one-half as required by the Pierce County Stormwater Management and Site Development Manual, Table 6.3.

Groundwater seepage was not encountered during our fieldwork (April and June 2010). Soil conditions remained relatively consistent throughout the depth of the test pits, and in our opinion, adequate separation will be maintained between potential groundwater elevations and the bottom of the infiltration facilities. However, ESNW should have an opportunity to review the final design and infiltration facility elevations.

A representative of ESNW should observe the final infiltration facility elevations during construction to confirm that soil conditions are as anticipated.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, construction of the RLSC buildings and associated improvements at the site is feasible from a geotechnical standpoint. The primary geotechnical considerations associated with the proposed development include foundation support, slab-on-grade subgrade support, and minimizing post-construction settlements.

Based on the results of our study, in our opinion the proposed buildings can be supported on conventional spread and continuous footings bearing on undisturbed, competent or recompacted native soil or structural fill. Topsoil or organic-rich soil should be completely removed under foundation, pavement and utility areas. Due to the variable topsoil depths, isolated areas may require additional excavation to expose bearing native soils. Slab-on-grade areas should be supported on a suitable capillary break material underlain by competent, undisturbed or recompacted native soils or structural fill.

TetraTech, Inc.
January 26, 2011
Revised February 18, 2011

This geotechnical study has been prepared for the exclusive use of TetraTech, Inc., and their representatives. No warranty, expressed or implied, is made. This study has been prepared in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area.

Site Preparation and Earthwork

Site preparation for this project will likely consist of installing temporary erosion control measures, constructing temporary traffic entrances, and clearing and grading activities. The majority of the site is vacant and demolition activities will be minimal. Once the site is cleared and stabilized, mass grading activities will proceed. Given the low topographic relief across the site, mass grading will likely be limited to cuts and fills of less than about ten feet.

Temporary Construction Entrances and Erosion Control

Temporary construction entrances and drive lanes, consisting of at least 12 inches of quarry spalls can be considered in order to minimize off-site soil tracking and to provide a stable access entrance surface, as necessary. Erosion control measures should consist of silt fencing placed along the down gradient side of the construction site, as appropriate. Where necessary, soil stockpiles should be protected to reduce soil erosion, as appropriate.

In-Situ Soils

Based on the conditions encountered at the test pit locations, the native soils underlying topsoil consist of recessional outwash sand and gravel. From a geotechnical standpoint, this type of soil is generally suitable for use as structural fill. Cobble sized particles greater than six inches should be distributed throughout fill lifts to help limit nesting of the larger sized particles. Recessional outwash sand and gravel deposits are generally considered free-draining and typically exhibit a low sensitivity to moisture. Soils encountered during site excavations that are excessively over the optimum moisture content may require moisture conditioning prior to placement and compaction. Conversely, soils that are substantially below the optimum moisture content may require moisture conditioning through the addition of water prior to use as structural fill.

Imported Soil

Imported soil intended for use as structural fill should consist of a well graded granular soil with a moisture content that is at or near the optimum level. During wet weather conditions, imported soil intended for use as structural fill should consist of a well graded granular soil with a fines content of five percent or less defined as the percent passing the #200 sieve, based on the minus three-quarter inch fraction.

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Structural Fill

Structural fill is defined as compacted soil placed in foundation, slab-on-grade, and roadway areas. In order to provide a consistent stable base, soils must be compacted along the entire foundation alignment and elements and must extend a minimum of 24 inches outside the structural elements. Fills placed to construct permanent slopes and throughout retaining wall and utility trench backfill areas are also considered structural fill. Soils placed in structural areas should be placed in maximum 12-inch loose lifts and be compacted to a relative compaction of 95 percent, based on the maximum dry density as determined by the Modified Proctor Method (ASTM D-1557-02). Compacting equipment and effort must be sufficient to adequately compact the soil to a minimum depth of 24 inches. Compaction means and methods must extend across the entire foundation zone and extend at least two feet on either side of design foundation alignments and elements. This is typically achieved using a hoe-pack and 120-series excavator or larger. ESNW should observe compaction means and methods and to conduct density tests to confirm design parameters are being met and to provide supplemental recommendations.

Foundations

Based on the results of our study, the proposed logistic support buildings can be supported on conventional spread and continuous footings bearing on competent, undisturbed or recompacted native soil or structural fill. The native soils encountered at the test pit locations consisted of poorly to well graded granular deposits in a normally consolidated condition. This type of soil is typically suitable for foundation support provided the subgrade is in a firm and unyielding condition prior to forming and pouring concrete. Soil conditions must be evaluated by ESNW. Where deemed necessary by the geotechnical engineer, compacting equipment and effort must be sufficient to adequately compact the native subgrade soil to a minimum depth of 24 inches and must extend a minimum of 24 inches on either side of the foundation alignment or element. This is typically achieved using a hoe-pack and 120-series excavator or larger. Where loose or unsuitable soil conditions are exposed at foundation subgrade elevations, compaction of the soils using heavy compacting equipment to the specifications of structural fill, or overexcavation and replacement with structural fill, will be necessary.

Assuming the buildings will be supported as described above, the following parameters can be used for design of the new foundations:

- | | |
|------------------------------------|----------------------------|
| • Allowable soil bearing capacity | 2,500 psf* |
| • Passive earth pressure | 300 pcf (equivalent fluid) |
| • Coefficient of friction | 0.35 |
| • Total settlement estimate | 1.0 inch |
| • Differential settlement estimate | 0.5 inches |

(*See calculation sheet attached to this report for parameters used)

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A one-third increase in the allowable soil bearing capacity can be assumed for short-term wind and seismic loading conditions. The above passive pressure earth and friction values include a factor-of-safety of 1.5.

The total settlement and differential settlement parameters above are estimated over the span of approximately 50 feet or one column bay spacing. The majority of the settlement will likely occur during construction, as dead loads are applied.

The foundation parameters above are applicable for subgrade soils consisting of either firm or recompacted native soil or structural fill.

Seismic Design Considerations

The 2006 International Building Code specifies several soil profiles that are used as a basis for seismic design of structures. Based on the soil conditions observed at the test sites, Site Class D, from table 1613.5.2, should be used for design.

ESNW utilized the U.S. Geological Survey USGS website to calculate values for mapped spectral accelerations. The USGS website provides a calculation program which references IBC design standards to calculate spectral accelerations for short and 1-second periods for a given zip code area.

The following parameters can be used for site-specific seismic site designs:

Spectral Response Accelerations

S_s (short period)	1.19 g
S_1 (1-second period)	0.41 g

Slab-On-Grade Floors

The slab-on-grade floors for the proposed buildings should be supported on a suitable capillary break material underlain by undisturbed, competent native soil or a compacted structural fill subgrade. Structural fill in slab-on-grade areas should be compacted to a minimum relative compaction of 95 percent throughout the upper one foot of subgrade. Unstable or yielding areas of the subgrade should be recompacted or overexcavated and replaced with suitable structural fill prior to construction of the slab. A modulus of subgrade reaction of 300 pci can be used for design.

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The building slab-on-grade areas should be provided with a minimum four inch capillary break. Capillary break soils should consist of a granular free draining sand and gravel soil that contains less than 5 percent fines (percent passing the #200 sieve, based on the minus three-quarter inch fraction). The outwash sand and gravel soils encountered at the site generally contain fines contents less than 5 percent and are considered free-draining. Provided soil conditions are approved by the geotechnical engineer, the native free draining sand and gravel soils can be considered for use as a capillary break. In areas where slab moisture is undesirable, installation of a vapor barrier placed below the slab should be considered. If a vapor barrier will be utilized, it should consist of a material specifically designed for that use and installed in accordance with the manufacturer's specifications.

Drainage

The presence of heavy groundwater seepage is not anticipated, except possibly in deeper site or utility excavations or where the contact between outwash and glacial till soils are exposed. Temporary measures to control surface water runoff during construction would likely involve interceptor trenches and sumps, as necessary.

In our opinion, given the presence of relatively free-draining soils across the site, footing drains can be omitted subsequent to approval by the geotechnical engineer. If footing drains will be used, they should be installed along building perimeter footings. A typical foundation drain detail is provided as Plate 3.

Excavations and Slopes

The Federal Occupation Safety and Health Administration (OSHA) and the Washington Industrial Safety and Health Act (WISHA) provide soil classification in terms of temporary slope inclinations. Based on the soil conditions encountered at the test pit locations, the site soils are classified as Type C by OSHA/WISHA. Temporary slopes over four feet in height in Type C soils must be sloped no steeper than 1.5H:1V (Horizontal:Vertical). If the recommended temporary slope inclination cannot be achieved, temporary shoring may be necessary to support excavations. Caving of the sand and gravel deposits should be expected and measures to shore temporary excavations should be considered prior to grading activities.

Permanent slopes should maintain a gradient of 2H:1V, or flatter, and should be planted with vegetation to enhance stability and to minimize erosion. The geotechnical engineer should observe temporary and permanent slopes to confirm the slope inclinations, and to provide additional excavation and slope recommendations, as necessary.

Warehouse Structure

The warehouse structure will be located directly north of Building 9500. Similar to other structures proposed in the RLSC site, we anticipate the warehouse building will be constructed at or near existing grades.

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Due to potential underground utility conflicts including but not limited to a main fiber optic and potable water service, no test pits were advanced in the proposed warehouse area. After review of the test pits located near the warehouse site, the following is a description of the conditions anticipated for that area. We reviewed test pits TP-13, TP-14, TP-30, TP-58, TP-106 – 109, TP-130 and TP-131, located in the vicinity of the proposed warehouse structure. Please refer to the test pit logs provided in Appendix A for a more detailed description of the surrounding soil and groundwater conditions.

We anticipate the soils underlying the warehouse envelope will consist of a layer of dark brown topsoil/organic silty sand transitioning to sand and gravel outwash deposits. There is also the potential for isolated fill given the level of development in this area.

Recommendations

Based on review of the test pits explored around the proposed warehouse site, in our opinion the recommendations provided in this geotechnical engineering report remain valid for this area.

Utility Support and Trench Backfill

In our opinion, the soils anticipated to be exposed in utility excavations will be generally suitable for support of utilities. Organic or highly compressible soils encountered in the trench excavations should not be used for supporting utilities. In general, the on-site soils should be suitable for use as structural backfill in the utility trench excavations, provided the soil is at or near the optimum moisture content at the time of placement and compaction. Moisture conditioning of the soils may be necessary prior to use as structural fill. Utility trench backfill should be placed and compacted to the specifications of structural fill provided in this report, or to the applicable Pierce County specifications. Placement of backfill in a condition that is dry of optimum should be avoided.

Pavement Sections

We understand up to about 30 acres of pavement will be constructed as part of the project plans. Traffic load distribution and average daily trip estimates were not available at the time of this report. We anticipate the pavements will range from lightly loaded asphalt to heavily loaded concrete sections.

The performance of site pavements is largely related to the condition of the underlying subgrade. To ensure adequate pavement performance, the subgrade should be in a firm and unyielding condition when subjected to proofrolling with a loaded dump truck. Structural fill in pavement areas should be compacted to the specifications detailed in the "Site Preparation and Earthwork" section of this report. It is possible that soft, wet, or otherwise unsuitable subgrade areas may still exist after base grading activities. Any areas containing unsuitable or yielding subgrade conditions will require remedial measures such as overexcavation and thicker crushed rock or structural fill sections prior to pavement.

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Design Parameters

Based on the soil conditions encountered at the test pit locations, in our opinion the following parameters can be used for pavement designs:

- California Bearing Ratio (CBR) for subgrade soil 15*
- Subgrade Resilient Modulus (MR) 20 ksi
- Base course Resilient Modulus (MR) 30 ksi

*(assumes subgrade soil is compacted to a firm and unyielding condition, or at least 95 percent of modified proctor prior to construction)

Flexible Pavement

For relatively high volume, heavily loaded pavements subjected to moderate to high, loaded truck traffic, the following preliminary pavement sections can be considered:

- Three inches of asphalt concrete (AC) placed over six inches of crushed rock base (CRB), or;
- Three inches of AC placed over four inches of asphalt treated base (ATB).

The AC, ATB and CRB materials should conform to WSDOT specifications. All soil base material should be compacted to at least 95 percent of the maximum dry density. Final pavement design recommendations can be provided once projected traffic loading has been determined.

Rigid Pavement

We referred to Pavement Analysis and Design, Huang, 1993 to determine rigid pavement design parameters for the subject project.

6-inch Rigid Concrete Pavement

- K value for slab-on-grade 1,200 pci
- Composite k value with 6" base course 900 pci
- Relative damage u_r 5.5
- Effective k value corrected for Loss of Support (1.0) 240 pci

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10-inch Rigid Concrete Pavement

- K value for slab-on-grade 1,600 pci
- Composite k value with 6" base course 1,000 pci
- Relative damage u_r 67
- Effective k value corrected for Loss of Support (1.0) 250 pci

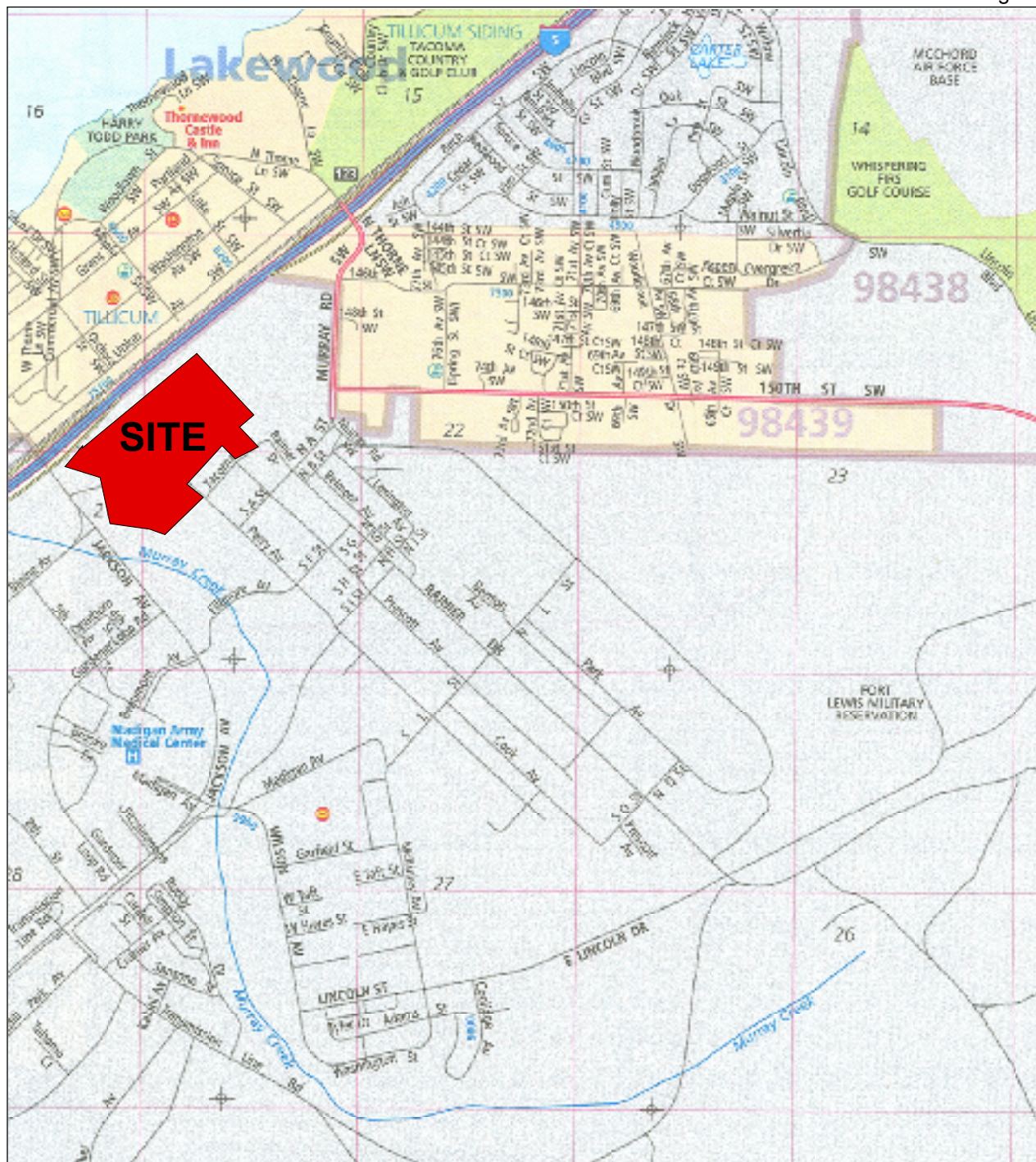
ESNW should review traffic estimates with respect to loading and travel distribution to confirm or modify the recommendations provided in this report.

LIMITATIONS

The recommendations and conclusions provided in this geotechnical engineering study are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. A warranty is not expressed or implied. Variations in the soil and groundwater conditions observed at the test locations may exist, and may not become evident until construction. ESNW should reevaluate the conclusions in this geotechnical engineering study if variations are encountered.

Additional Services

ESNW should have an opportunity to review the final design with respect to the geotechnical recommendations provided in this report. ESNW should also be retained to provide testing and consultation services during construction.



Reference:
Pierce County
Map 862
By Thomas Brothers Maps
Dated 2009



NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

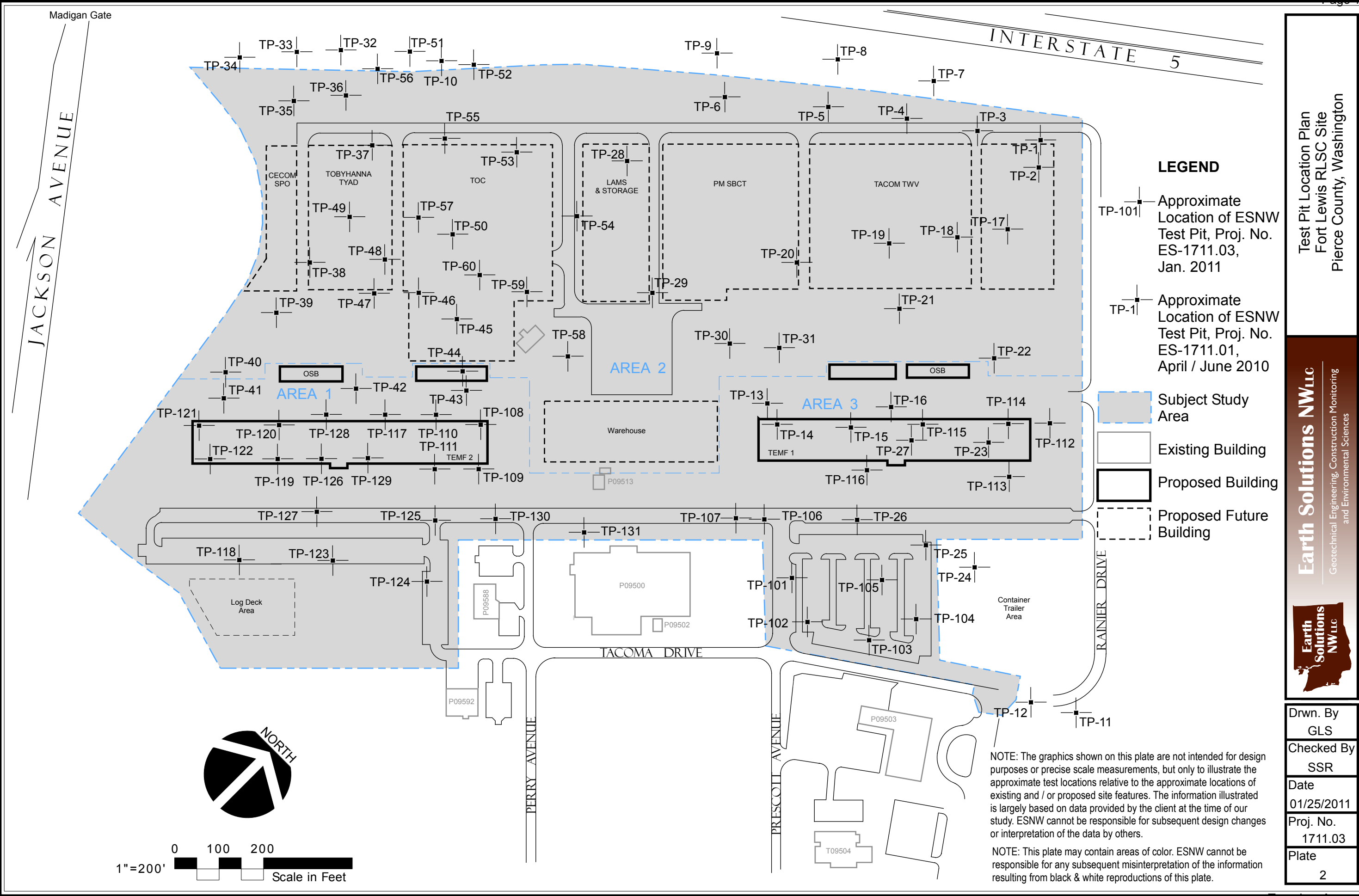


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Geotechnical Engineering, Construction Monitoring
and Environmental Sciences

Vicinity Map
Fort Lewis RLSC Site
Pierce County, Washington

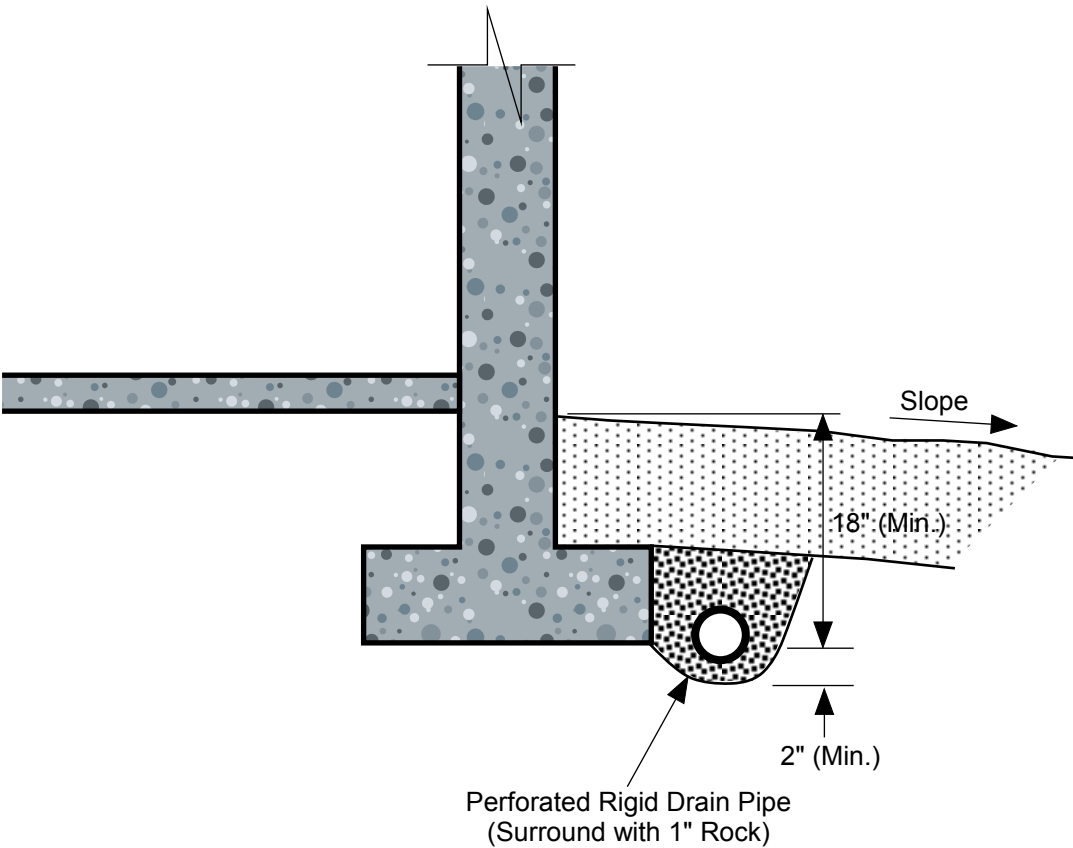
Drwn.	GLS	Date 01/25/2011	Proj. No.	1711.03
Checked	SSR	Date Jan. 2011	Plate	1



Test Pit Location Plan
Fort Lewis RLSC Site
Pierce County, Washington

Earth Solutions NW LLC
Geotechnical Engineering, Construction Monitoring
and Environmental Sciences



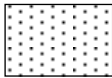
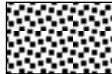


NOTES:

- Do NOT tie roof downspouts to Footing Drain.
- Surface Seal to consist of 12" of less permeable, suitable soil. Slope away from building.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:

-  Surface Seal; native soil or other low permeability material.
-  1" Drain Rock



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FOOTING DRAIN DETAIL
Fort Lewis RLSC Site
Pierce County, Washington

Drwn. GLS	Date 01/26/2011	Proj. No. 1711.03
Checked SSR	Date Jan. 2011	Plate 3

APPENDIX A**SUBSURFACE EXPLORATION****ES-1711.03**

The subsurface conditions at the site were explored by excavating a total of 60 test pits across accessible portions of the development envelope. The subsurface explorations were completed in April and June 2010. The approximate test pit locations are illustrated on Plate 2 of this report. Logs of the test pits are provided in this Appendix. The test pits were excavated to a maximum depth of ten feet below existing grades.

Earth Solutions NW_{LLC}

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
		HIGHLY ORGANIC SOILS			PT

DUAL SYMBOLS are used to indicate borderline soil classifications.

The discussion in the text of this report is necessary for a proper understanding of the nature of the material presented in the attached logs.



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TEST PIT NUMBER **TP-101**

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PAGE 1 OF 1

CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 2": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5		MC = 3.30%	SP	<p>Brown poorly graded SAND with gravel, loose, wet</p> <p>-contains cobbles -heavy caving -gravel layers</p>
			5.0	<p>Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.</p> <p>Bottom of test pit at 5.0 feet.</p>

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TEST PIT NUMBER TP-102

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 2": moss & brush AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 4.20%	SP		<p>Brown poorly graded SAND with gravel, loose, moist</p> <p>-with cobbles</p> <p>-moderate caving</p> <p>-gravel layers</p> <p>-medium dense</p>
6.0					<p>Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation.</p> <p>Bottom of test pit at 6.0 feet.</p>

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TEST PIT NUMBER TP-103

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION _____
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION _____
NOTES <u>Depth of Topsoil & Sod 2": moss & brush</u>	AFTER EXCAVATION _____



DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 3.10%	SP		<p>Brown poorly graded SAND with gravel, loose, moist</p> <ul style="list-style-type: none"> -with cobbles -gravel layers -moderate caving -becomes medium dense
					<p>Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.</p> <p>Bottom of test pit at 5.0 feet.</p>

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DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 2": moss AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SP		Brown poorly graded SAND with gravel, loose, moist (Fill) -moderate organics -with cobbles -moderate caving
5		MC = 2.90%	SP		Brown poorly graded SAND with gravel, loose, moist
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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TEST PIT NUMBER **TP-105**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 2": moss AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
				Brown poorly graded SAND with gravel, loose, moist
				-with cobbles
				-gravel layers
				-becomes medium dense
5		MC = 4.00%	SP	5.0
				Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 5.0 feet.

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TEST PIT NUMBER TP-106

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION --
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION --
NOTES Depth of Topsoil & Sod 2"; moss AFTER EXCAVATION --

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown poorly graded SAND with gravel, loose, moist
					-with cobbles
					-moderate caving
					-becomes medium dense
5					
		MC = 4.20%	SP		
					7.0
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 7.0 feet.

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CLIENT TetraTechPROJECT NAME Fort Lewis RLSC SitePROJECT NUMBER 1711.03PROJECT LOCATION Pierce County, WashingtonDATE STARTED 1/20/11COMPLETED 1/20/11

GROUND ELEVATION _____


TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION ---LOGGED BY SSRCHECKED BY SSRAT END OF EXCAVATION ---NOTES Depth of Topsoil & Sod 3": mossAFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 4.40%	GW		<p>Brown well graded GRAVEL with sand, loose, moist</p> <p>-moderate caving</p> <p>-with cobbles</p>
8.0					<p>Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.</p> <p>Bottom of test pit at 8.0 feet.</p>

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CLIENT TetraTechPROJECT NAME Fort Lewis RLSC SitePROJECT NUMBER 1711.03PROJECT LOCATION Pierce County, WashingtonDATE STARTED 1/20/11COMPLETED 1/20/11

GROUND ELEVATION _____

TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION ---LOGGED BY SSRCHECKED BY SSRAT END OF EXCAVATION ---NOTES Depth of Topsoil & Sod 12": field grassAFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
			GP	Brown poorly graded GRAVEL with sand, loose, moist
5		MC = 2.90%		-moderate caving -sandy layers
			SP	Brown poorly graded SAND with gravel, medium dense, moist
		MC = 5.60%		Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

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TEST PIT NUMBER **TP-109**

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CLIENT TetraTech

PROJECT NAME Fort Lewis RLSC Site

PROJECT NUMBER 1711.03

PROJECT LOCATION Pierce County, Washington

DATE STARTED 1/20/11

COMPLETED 1/20/11

GROUND ELEVATION

TEST PIT SIZE

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD

AT TIME OF EXCAVATION —


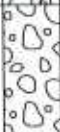
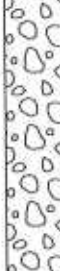
LOGGED BY SSR

CHECKED BY SSR

AT END OF EXCAVATION

NOTES Depth of Topsoil & Sod 3": field grass

AFTER EXCAVATION —

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 12.10% Fines = 10.30%	GP- GM		Dark brown poorly graded GRAVEL with silt and sand, loose, moist
					Brown poorly graded GRAVEL with sand, loose, moist
5		MC = 2.60%	GP		moderate caving
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11

Tuesday, August 16, 2011



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TEST PIT NUMBER **TD-110**

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS: AT TIME OF EXCAVATION <u>---</u> AT END OF EXCAVATION <u>---</u> AFTER EXCAVATION <u>---</u>
EXCAVATION METHOD _____	
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	
NOTES <u>Depth of Topsoil & Sod 2": moss</u>	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			GM		Dark brown silty GRAVEL with sand, loose, moist
				1.5	
			GP		Brown poorly graded GRAVEL with sand, loose, moist
					-contains cobbles
5					-medium dense
		MC = 3.40%		8.0	
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11

Tuesday, August 16, 2011





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TEST PIT NUMBER **TP-111**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": forest duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		SM		Dark brown silty SAND with gravel, loose, wet -abundant fine organic material
		GW		Brown well graded GRAVEL with sand, loose, moist -medium dense
5				Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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TEST PIT NUMBER TP-112

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION _____
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION _____
NOTES <u>Depth of Topsoil & Sod 3"</u>	AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 10.80% Fines = 7.60%		2.0	Brown poorly graded GRAVEL with silt and sand, medium dense, moist
5			GP-GM		-with cobbles
		MC = 7.20%		8.0	Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 8.0 feet.

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TEST PIT NUMBER **TD-113**

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS: AT TIME OF EXCAVATION _____ AT END OF EXCAVATION _____ AFTER EXCAVATION _____
EXCAVATION METHOD _____	
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	
NOTES <u>Depth of Topsoil & Sod 3"; field grass</u>	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 4.30%	GW		<p>Brown well graded GRAVEL with sand, medium dense, moist</p> <p>-contains cobbles</p> <p>-sandy layers</p> <p>Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.</p> <p>Bottom of test pit at 8.0 feet.</p>
8.0					

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TEST PIT NUMBER TP-14

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 3": field grass</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -moderate organics
5			GW		Brown well graded GRAVEL, medium dense, moist -abundant cobbles
		MC = 3.30%			
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -abundant fine organic material
5		MC = 6.10%	GW		Brown well graded GRAVEL with sand, loose, moist
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.



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TEST PIT NUMBER **TD-116**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist -abundant fine organic material
2.5				
			GW	Brown well graded GRAVEL with sand, loose, moist -contains cobbles -moderate caving -becomes medium dense
5		MC = 4.10%		
			8.0	Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.


GENERAL BH / TP / WELL 1711-3.GPJ GINT US GDT 2/1/11



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TEST PIT NUMBER **TP-117**Page 207 of 296
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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 2": moss AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown well graded GRAVEL with sand, loose, moist
5		MC = 4.50%	GW		-medium dense
				8.0	Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11




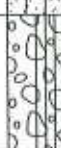


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TEST PIT NUMBER **TP-18**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 4"; field grass AFTER EXCAVATION ---



DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, wet (Fill)
				1.5	-abundant fine organic material
			SW		Brown well graded SAND with gravel, medium dense, moist (Fill)
				2.5	
					Dark brown silty SAND with gravel, medium dense, moist
		MC = 18.10% Fines = 16.10%	SM		-abundant fine organics
5				5.0	
			GP-GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist
		MC = 7.10%		8.0	-contains cobbles
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 15.60%	SM		Dark brown silty SAND with gravel, loose, moist to wet (Fill) -abundantly fine organic material
5		MC = 4.40%	SP		Brown poorly graded SAND with gravel, loose, moist
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH/TP / WELL 1711-3 GFIJ GINT US GDT 2/1/11



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TEST PIT NUMBER **TP 120**

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PAGE 1 OF 1

CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Tospoil & Sod 3": moss AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Brown silty SAND with gravel, loose, wet
				1.5	
			SW		Brown well graded SAND with gravel, loose, moist
					-heavy caving
5					-medium dense
		MC = 3.70%		7.0	
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist to wet
				1.5	-abundant fine organic material
					Brown well graded SAND with gravel, loose, moist
					-heavy caving
5			SW		-contains cobbles
		MC = 3.00%			-medium dense
				8.0	Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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TEST PIT NUMBER **TP-122**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -abundant fine organic material
5		MC = 6.00% Fines = 3.00%	GW		Brown well graded GRAVEL with sand, loose, moist -medium dense
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11

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TEST PIT NUMBER **TP-123**

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PAGE 1 OF 1

CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 4": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist to wet
				1.5	-abundant fine organic material
			SW		Brown well graded SAND with gravel, loose, moist
					-contains trace cobbles
					-moderate caving
5		MC = 7.30%		5.0	-medium dense
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 5.0 feet.

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TEST PIT NUMBER **TP-124**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5			SM		Dark brown silty SAND with gravel, loose, moist (Fill) -abundant fine organics -large cobbles
		MC = 5.60%	GP-GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

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TEST PIT NUMBER **TP-125**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": moss & field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist to wet -abundant fine organic material
		MC = 7.10%	GP-GM		Brown poorly graded GRAVEL with sand, loose, moist -medium dense
5					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": moss & brambles AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		MC = 11.50% Fines = 8.60%	GP- GM	Dark brown poorly graded GRAVEL with sand and silt, loose, moist -abundant fine organics
5		MC = 4.30%	GW	Brown well graded GRAVEL with sand, loose, moist -trace cobbles -slight caving
				Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

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CLIENT TetraTechPROJECT NAME Fort Lewis RLSC SitePROJECT NUMBER 1711.03PROJECT LOCATION Pierce County, WashingtonDATE STARTED 1/20/11 COMPLETED 1/20/11

GROUND ELEVATION _____ TEST PIT SIZE _____

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD _____

AT TIME OF EXCAVATION ---

LOGGED BY SSRCHECKED BY SSR

AT END OF EXCAVATION ---

NOTES Depth of Topsoil & Sod 3": moss & duff

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -abundant fine organics
			SW		Brown well grade SAND with gravel, loose, moist -medium dense
5		MC = 2.70%			Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.





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TEST PIT NUMBER TP-128

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 3": moss & field grass</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			GM		Dark brown silty GRAVEL with sand, loose, moist
				3.0	
			GP-GM		-abundant fine organics
5		MC = 8.90%		5.0	Tan poorly graded GRAVEL with silt and sand, medium dense, moist
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 5.0 feet.

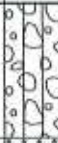



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TEST PIT NUMBER TP-129

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3": moss AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			GM		Dark brown silty GRAVEL with sand, loose, moist -abundant fine organic material
			SW		Brown well graded SAND with gravel, loose, moist -medium dense
5		MC = 3.90%		5.0	Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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TEST PIT NUMBER **TP-130**

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CLIENT TetraTech PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.03 PROJECT LOCATION Pierce County, Washington
DATE STARTED 1/20/11 COMPLETED 1/20/11 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 4": moss AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.5	-moderate fine organic material
			GP		Brown poorly graded GRAVEL with sand, loose, moist
5					-heavy caving -sandy layers
		MC = 4.20%			-medium dense -becomes wet
				8.0	Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-3.GPJ GINT US.GDT 2/1/11



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TEST PIT NUMBER TP-13196

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CLIENT <u>TetraTech</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.03</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>1/20/11</u> COMPLETED <u>1/20/11</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION _____
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION _____
NOTES <u>Depth of Topsoil & Sod 3": moss & brush</u>	AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -abundant fine organic material
			SW		Brown well graded SAND with gravel, loose, moist -moderate caving
5		MC = 3.30%	GP		Brown poorly graded GRAVEL, medium dense, moist, trace silt
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": moss & duff AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM	0.5	Brown silty SAND with gravel, loose, moist to wet
			GP-GM	2.5	Brown poorly graded GRAVEL with sand, loose, moist
					-rootlets to ~2'
			SP	5.0	Brown poorly graded SAND with gravel, loose, moist
5		MC = 2.70%			Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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TEST PIT NUMBER TP-2

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": moss & duff AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		MC = 4.30% Fines = 1.60%	GW	Brown well graded GRAVEL with sand, medium dense, moist
			2.0	[USDA Classification: extremely gravelly coarse SAND]
				Brown poorly graded SAND with gravel, medium dense, moist
5			SP	
		MC = 4.10%	6.0	-slight caving
				Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-3

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/14/10</u> COMPLETED <u>4/14/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION _____
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION _____
NOTES <u>Depth of Topsoil & Sod 6": moss & duff</u>	AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 3.70%	SW		Brown well graded SAND with gravel, loose, moist -increase in gravel content -moderate caving Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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TEST PIT NUMBER TP-4

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/14/10</u> COMPLETED <u>4/14/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS: AT TIME OF EXCAVATION <u>---</u> AT END OF EXCAVATION <u>---</u> AFTER EXCAVATION <u>---</u>
EXCAVATION METHOD _____	
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	
NOTES <u>Depth of Topsoil & Sod 14": moss & duff</u>	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM		Dark brown silty SAND, loose, moist
		MC = 7.00%			Brown poorly graded SAND with gravel, medium dense, moist
			SP		variable gravel content
5		MC = 4.90% Fines = 0.90%			[USDA Classification: very gravelly coarse SAND]
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/7/10





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TEST PIT NUMBER TP-5

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 6": moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 12.30%	SM		Dark brown silty SAND with gravel, loose, moist (Fill) moderate organics
5					
		MC = 6.20%	SM		7.0 Brown silty SAND with gravel, medium dense, moist 7.5 Test pit terminated at 7.5 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.5 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-6**

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/14/10</u> COMPLETED <u>4/14/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 18": moss & duff</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 17.20%	SM		Dark brown silty SAND with gravel, loose, moist
			GW		Brown well graded GRAVEL with sand, medium dense, moist
5		MC = 4.20% Fines = 2.00%			[USDA classification: extremely gravelly loamy coarse SAND] Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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TEST PIT NUMBER **TP-7**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 24": grass of duff (edge of trees) AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND, loose, moist
				2.0	
			SP		Brown poorly graded SAND with gravel, medium dense, moist
5		MC = 3.60%		5.0	-slight caving
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



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TEST PIT NUMBER TP-8

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8": moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 8.70%	SM		Dark brown silty SAND with gravel, loose, moist
			GP-GW		Brown poorly to well graded GRAVEL with sand, medium dense, moist
5		MC = 5.30%			Test pit terminated at 5.5 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.5 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10





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TEST PIT NUMBER **TP-96**

PAGE 1 OF 1

CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 18": moss & duff AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.5	
			GP		Brown poorly graded GRAVEL with sand, medium dense, moist
					-sandy layers
5		MC = 2.80% Fines = 0.70%		5.0	[USDA Classification: extremely gravelly coarse SAND]
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

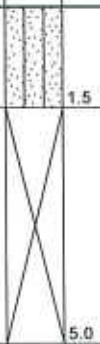


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TEST PIT NUMBER TP-10

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 18": moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 29.30%	SM		Dark brown silty SAND with gravel, loose, moist
			SP		Brown poorly graded SAND with gravel, medium to dense, moist
5		MC = 4.60%			-slight caving
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10





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TEST PIT NUMBER TP-1196

PAGE 1 OF 1

CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 4": brambles & brush AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Brown silty SAND with gravel, medium dense, moist (Fill)
				2.0	-contains cobbles
			GW-GM		Brown well graded GRAVEL with silt and sand, medium dense, moist
5		MC = 4.80%		5.0	
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10





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TEST PIT NUMBER **TP-1296**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 4": field grass, brush & brambles AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 13.00%	SM		Dark brown silty SAND with gravel, loose, moist (Fill) -contains cobbles becomes medium dense
		MC = 11.20%	GM		Brown silty GRAVEL with sand, medium dense, moist -contains cobbles
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/7/10

Tuesday, August 16, 2011



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TEST PIT NUMBER TP-13

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/14/10</u> COMPLETED <u>4/14/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 4": field grass</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 17.20% Fines = 19.10%	SM		Dark brown silty SAND with gravel, loose, moist (Fill) -trace cobbles [USDA Classification: very gravelly coarse sandy LOAM]
5		MC = 5.90%	SW-SM		Brown well graded SAND with silt and gravel, medium dense, moist -slight caving
10		MC = 4.20%	GP		Brown poorly graded GRAVEL with sand, medium dense, moist -moderate caving
					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-14

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS: _____
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
5		MC = 22.50% Fines = 17.70%	SM		Dark brown silty SAND with gravel, loose, moist -contains trace to moderate cobbles [USDA Classification: very gravelly coarse sandy LOAM]
10		MC = 3.90%	SW		Brown well graded SAND with gravel, medium dense, moist -contains cobbles
					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8"; field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
			1.0	
			SW	Brown well graded SAND with gravel, medium dense, moist
		MC = 3.90%		-contains cobbles
			4.5	-gravel layers throughout
5				Grades to poorly graded GRAVEL with sand, medium dense, moist
			GP	
			10.0	
10		MC = 5.20% Fines = 3.40%		[USDA Classification: extremely gravelly loamy coarse SAND]
				Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 10.0 feet.





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TEST PIT NUMBER TP-16

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/14/10 COMPLETED 4/14/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 24": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 17.50%	SM		Dark brown silty SAND, loose, moist
		MC = 4.40%	SP		Brown poorly graded SAND with gravel, medium dense, moist -contains cobbles -slight caving
5					
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10



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TEST PIT NUMBER TP-17

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 14": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
				1.0
			SP	Brown poorly graded SAND with gravel, loose, moist
				becomes medium dense
5		MC = 7.10%		5.0
				Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10





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TEST PIT NUMBER **TP-18**

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/15/10</u> COMPLETED <u>4/15/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS: AT TIME OF EXCAVATION <u>---</u> AT END OF EXCAVATION <u>---</u> AFTER EXCAVATION <u>---</u>
EXCAVATION METHOD _____	
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	
NOTES <u>Depth of Topsoil & Sod 12": moss & grass</u>	

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 17.30%	SM		Dark brown silty SAND with gravel, loose, moist
			SP		Brown poorly graded coarse SAND with gravel, loose, moist contains cobbles moderate caving
5		MC = 7.30%			Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/7/10

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TEST PIT NUMBER 1711.01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 12": moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.0	
			GW		Brown well graded GRAVEL with sand, medium dense, moist -contains cobbles -moderate caving
5		MC = 5.00% Fines = 3.10%		5.0	[USDA Classification: extremely gravelly loamy coarse SAND] Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10





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TEST PIT NUMBER **TP-29**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 12": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist (Fill) becomes brown
			GP- GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist -moderate caving
5		MC = 3.70%			
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/7/10



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TEST PIT NUMBER **TP-2196**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 12": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.0	
			GP- GW		Brown poorly graded GRAVEL with sand, medium dense, moist
5					-moderate caving
		MC = 5.70%		7.0	
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

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TEST PIT NUMBER TP-22

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 24": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		MC = 15.90% Fines = 11.50%	GP- GM	Dark brown poorly graded GRAVEL with silt, and sand, loose, moist
				[USDA Classification: extremely gravelly coarse sandy LOAM]
			GP- GW	Brown poorly to well graded GRAVEL with sand, medium dense, moist
5				-moderate caving
		MC = 7.10%		
				Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1 GPJ GINT US GDT 7/2/10



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TEST PIT NUMBER TP-23

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 18": brush AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 9.50%	SM	1.5	Dark brown silty SAND with gravel, loose, moist
5			GP- GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist contains cobbles
		MC = 5.80% Fines = 6.90%		7.0	[USDA classification: extremely gravelly loamy coarse SAND]
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

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TEST PIT NUMBER 1711-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": moss & duff AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			GM	0.5	Brown silty GRAVEL with sand, loose, moist
					Brown poorly graded GRAVEL with sand, medium dense, moist
					-abundant cobbles
5			GP		-moderate caving
		MC = 3.80%		7.0	Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 7.0 feet.

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TEST PIT NUMBER 1711.01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Dark brown silty SAND with gravel, loose, moist
		MC = 21.30%	SM		-contains trace cobbles
5					Brown poorly graded SAND with gravel, medium dense, moist
			SP		-moderate caving -contains trace cobbles
		MC = 3.40%			Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

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CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>4/15/10</u> COMPLETED <u>4/15/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION _____
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION _____
NOTES <u>Depth of Topsoil & Sod 3": moss & brush</u>	AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist (Fill)
		MC = 22.60% Fines = 19.20%	GM	Grades to silty GRAVEL with sand, medium dense, moist
5				[USDA Classification: very gravelly coarse sandy LOAM]
		MC = 5.00%	SP	Brown poorly graded coarse SAND with gravel, medium dense, moist -trace cobbles and silt
				Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 8.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

Tuesday, August 16, 2011





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TEST PIT NUMBER TP-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 10": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 17.20%	SM		Dark brown silty SAND with gravel, loose, moist (Fill) -trace cobbles
5					
		MC = 5.10%	SP		Brown poorly graded SAND with gravel, medium dense, moist
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

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TEST PIT NUMBER 1711-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8"; moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
			GW		Brown well graded GRAVEL with sand, medium dense, moist
5		MC = 4.00% Fines = 1.30%			[USDA Classification: extremely gravelly coarse SAND] -moderate cobbles
			GP-GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist
10		MC = 6.20%			-contains cobbles and small boulders
					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10





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TEST PIT NUMBER TP-29

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION --
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION --
NOTES Depth of Topsoil & Sod 6": moss & duff AFTER EXCAVATION --

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
			SP		Brown poorly graded SAND with gravel, medium dense, moist -contains cobbles -slight caving
5		MC = 5.50%		5.5	Test pit terminated at 5.5 feet below existing grade. No ground water encountered during excavation. Bottom of test pit at 5.5 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-30

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 8": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		MC = 9.70%	GM	Dark brown silty GRAVEL with sand, loose, moist (Fill)
			3.5	
5		MC = 4.20% Fines = 9.10%	GP- GM	Brown poorly graded GRAVEL with silt and sand, medium dense, moist
			6.0	
				[USDA Classification: extremely gravelly coarse sandy LOAM] Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.



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TEST PIT NUMBER TP-3196

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 4/15/10 COMPLETED 4/15/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS: _____
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8": moss & duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
					-trace cobbles
			SP		Brown poorly graded SAND with gravel, medium dense, moist
5					-contains cobbles
		MC = 4.70%			-slight caving
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

Tuesday, August 16, 2011



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TEST PIT NUMBER **TP-02**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 10": field grass (edge of woods) AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 3.00% Fines = 1.10%	GW		Brown well graded GRAVEL with sand, loose, moist -contains cobbles -becomes medium dense [USDA Classification: extremely gravelly coarse SAND]
5		MC = 6.20% Fines = 7.40%	GP- GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist [USDA Classification: extremely gravelly LOAM]
		MC = 4.60%	SP		Brown poorly graded SAND with gravel, medium dense, moist -contains cobbles -moderate caving
10		MC = 4.10%			Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-03**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 10": field grass & brambles AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 8.70% Fines = 6.00%		2.0	
			GP-GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist [USDA Classification: extremely gravelly loamy SAND]
5				6.0	
		MC = 4.40%	SP		Brown poorly graded coarse SAND with gravel, medium dense, moist
				8.5	
			GP-GM		Brown poorly graded GRAVEL with silt and sand, medium dense, moist [USDA Classification: extremely gravelly LOAM]
10		MC = 6.10% Fines = 7.50%		10.0	
					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

Tuesday, August 16, 2011



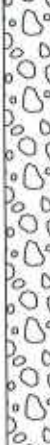


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TEST PIT NUMBER TP 34

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 12": field grass (edge of woods) AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
			SP		Brown poorly graded SAND with gravel, medium dense, moist
5		MC = 3.00%	GP		Brown poorly graded GRAVEL with sand, medium dense, moist -contains cobbles -moderate caving
		MC = 3.80%			Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 9.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/7/10



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TEST PIT NUMBER 1711-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 10": field grass & brambles AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
		MC = 4.30%		
5			SP	Brown poorly graded SAND with gravel, loose, moist -contains cobbles -slight caving
		MC = 7.30%		
				Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 9.0 feet.

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TEST PIT NUMBER TP-36

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 12": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.5	
			SM		Brown silty SAND with gravel, medium dense, moist
		MC = 8.60%			-contains cobbles
				4.5	
5			SP		Brown poorly graded SAND with gravel, medium dense, moist
					-contains cobbles
					-moderate caving
		MC = 4.20%		8.0	
					Test pit terminated at 8.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 8.0 feet.






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TEST PIT NUMBER TP-37

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 8": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM		0.5 Dark brown silty SAND with gravel, loose, moist
			SP		Brown poorly graded SAND with gravel, medium dense, moist
		MC = 3.20% Fines = 1.40%		2.0	-contains cobbles
5			GW		Grades to well graded GRAVEL with sand, medium dense, moist
		MC = 3.30%		6.0	[USDA Classification: extremely gravelly coarse SAND]
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-08

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 10": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
			1.5	
				Brown poorly graded SAND with gravel, loose, moist
				contains cobbles
5			SP	
		MC = 4.40%	7.0	
				Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 7.0 feet.

GENERAL 8H / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10





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TEST PIT NUMBER **TP-39**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 10": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Dark brown silty SAND with gravel, loose, moist (Fill)
			SM		
5		MC = 3.10%	GW		Brown well graded GRAVEL with sand, medium dense, moist
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10

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TEST PIT NUMBER **TP-40**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM	0.5 Brown silty SAND with gravel, loose, moist
		MC = 2.90%		Brown poorly graded SAND with gravel, loose, moist
				-contains cobbles
				-becomes medium dense
5			SP	-moderate caving
10		MC = 4.20%		10.0
				Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-4196

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM	0.5	Brown silty SAND with gravel, loose, moist
		MC = 3.20%			Brown poorly graded SAND with gravel, loose, moist
					-contains cobbles
5			SP		-becomes medium dense
					-moderate caving
10		MC = 3.70%		10.0	Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-42**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Brown silty SAND with gravel, loose, damp
		MC = 2.90%		Brown poorly graded SAND with gravel, loose, moist
5			SP	-becomes medium dense -moderate caving
		MC = 5.00%		
				Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 9.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10








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TEST PIT NUMBER TP-4396

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PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 4": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		0.5 Brown silty SAND with gravel, medium dense, damp (Fill)
			SM		1.0 Dark brown silty SAND with gravel, loose, moist
					Brown poorly graded GRAVEL with sand, loose, moist
5		MC = 5.50%	GP		-moderate caving
10		MC = 6.40%	SP		9.0 Brown poorly graded SAND, loose, moist
					10.0 Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10

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TEST PIT NUMBER 1711-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0				
			SM	Dark brown silty SAND with gravel, loose, moist
		MC = 4.00%		Brown poorly graded SAND with gravel, loose, moist
				-contains cobbles
5			SP	-slight caving
		MC = 3.20%		Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation.
				Bottom of test pit at 9.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

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TEST PIT NUMBER TP-45

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
		MC = 16.10%	SM		Dark brown silty SAND with gravel, loose, moist
				2.0	
		MC = 3.90%	SP		Brown poorly graded SAND with gravel, loose, moist -contains cobbles -becomes medium dense
5					
		MC = 3.50%		7.0	
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-46**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			GP		Brown poorly graded GRAVEL with sand, loose, moist -contains cobbles -becomes medium dense
5		MC = 4.10%	SP		Brown poorly graded SAND with gravel, medium dense, moist
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.




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TEST PIT NUMBER 17-47

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
5		MC = 7.70%	SP		Brown poorly graded SAND with gravel, medium dense, moist
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER 10-48

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				2.0	
			SP		Brown poorly graded SAND with gravel, medium dense, moist
5		MC = 4.30%		5.0	
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.


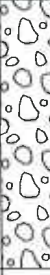


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TEST PIT NUMBER TP-496

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 3": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Brown silty SAND with gravel, medium dense, moist (Fill)
			GP		Brown poorly graded GRAVEL with sand, medium dense, moist
5		MC = 4.80%			-slight caving
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.


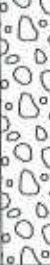


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TEST PIT NUMBER TP-0096

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/23/10 COMPLETED 6/23/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 3"; field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
				1.0	
			GP		Brown poorly graded GRAVEL with sand, medium dense, moist
5		MC = 3.70%		5.0	
					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-51**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 5.80% Fines = 2.80%			
5			GP		Brown poorly graded GRAVEL with sand, medium dense, moist [USDA Classification: extremely gravelly coarse SAND] -moderate caving -gravel pockets
10		MC = 4.80%			Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER **TP-52**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
5		MC = 4.70% Fines = 3.10%	GW		Brown well graded GRAVEL with sand, medium dense, moist -contains cobbles and sand pockets [USDA Classification: extremely gravelly loamy coarse SAND] -slight caving
10		MC = 4.70% Fines = 3.40%	GP		Grades to poorly graded GRAVEL with sand, medium dense, moist [USDA Classification: extremely gravelly coarse sandy LOAM]
					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10

Tuesday, August 16, 2011



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TEST PIT NUMBER **TP-63**

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 10": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 7.70%	SM		Brown silty SAND with gravel, medium dense, moist -contains cobbles
5					-moderate caving
			GP		Brown poorly graded GRAVEL with sand, medium dense, moist -contains cobbles and sand pockets
10		MC = 4.20%			Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



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TEST PIT NUMBER TP-54

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": brambles & duff AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 4.50% Fines = 4.20%		1.5	Dark brown well graded GRAVEL with sand, medium dense, moist
			GW		[USDA Classification: extremely gravelly loamy coarse SAND]
5				6.5	Brown poorly graded GRAVEL with sand, medium dense, moist
		MC = 3.10%	GP		
				9.0	Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 9.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US GDT 7/2/10

Tuesday, August 16, 2011



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TEST PIT NUMBER 1711-01

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 6": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 5.80%		2.0	-large cobbles
5			GP		Brown poorly graded GRAVEL with sand, medium dense, moist
					-contains large cobbles
					-sand pockets
		MC = 4.50%		7.0	-moderate caving
					Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-01 GPJ GINT US GDT 7/2/10



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TEST PIT NUMBER TP-56

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CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 10": forest duff AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist -contains cobbles
		MC = 9.20%			Brown poorly graded SAND with gravel, loose, moist -contains cobbles
5			SP		-slight caving
		MC = 2.90%			Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 7.0 feet.



Earth Solutions NW
2881 152nd Avenue N.E.
Redmond, Washington 98052
Telephone: 425-284-3300
Fax: 425-284-2855

TEST PIT NUMBER TP-07

Page 1 of 1
PAGE 1 OF 1

CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 8": field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 5.50%		1.5	Brown poorly graded GRAVEL with sand, medium dense, moist
5			GP		-contains cobbles
					-moderate caving
		MC = 4.40%		7.0	Test pit terminated at 7.0 feet below existing grade. No groundwater encountered during excavation.
					Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL 1711-1.GPJ GINT US.GDT 7/2/10



Earth Solutions NW
2881 152nd Avenue N.E.
Redmond, Washington 98052
Telephone: 425-284-3300
Fax: 425-284-2855

TEST PIT NUMBER TP-58

Page 279 of 296
PAGE 1 OF 1

CLIENT <u>Tetra-Tech Inc.</u>	PROJECT NAME <u>Fort Lewis RLSC Site</u>
PROJECT NUMBER <u>1711.01</u>	PROJECT LOCATION <u>Pierce County, Washington</u>
DATE STARTED <u>6/24/10</u> COMPLETED <u>6/24/10</u>	GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR <u>NW Excavating</u>	GROUND WATER LEVELS:
EXCAVATION METHOD _____	AT TIME OF EXCAVATION <u>---</u>
LOGGED BY <u>SSR</u> CHECKED BY <u>SSR</u>	AT END OF EXCAVATION <u>---</u>
NOTES <u>Depth of Topsoil & Sod 8": field grass</u>	AFTER EXCAVATION <u>---</u>

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 2.40% Fines = 0.80%	GW		Brown well graded GRAVEL with sand, medium dense, moist -contains cobbles [USDA Classification: extremely gravelly coarse SAND]
5		MC = 3.60%			Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



Earth Solutions NW
2881 152nd Avenue N.E.
Redmond, Washington 98052
Telephone: 425-284-3300
Fax: 425-284-2855

CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION _____
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION _____
NOTES Depth of Topsoil & Sod 8"; field grass AFTER EXCAVATION _____

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 3.60%	SP		Brown poorly graded SAND with gravel, loose, moist -contains cobbles
5					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.



Earth Solutions NW
2881 152nd Avenue N.E.
Redmond, Washington 98052
Telephone: 425-284-3300
Fax: 425-284-2855

CLIENT Tetra-Tech Inc. PROJECT NAME Fort Lewis RLSC Site
PROJECT NUMBER 1711.01 PROJECT LOCATION Pierce County, Washington
DATE STARTED 6/24/10 COMPLETED 6/24/10 GROUND ELEVATION _____ TEST PIT SIZE _____
EXCAVATION CONTRACTOR NW Excavating GROUND WATER LEVELS:
EXCAVATION METHOD _____ AT TIME OF EXCAVATION ---
LOGGED BY SSR CHECKED BY SSR AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 8"; field grass AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Dark brown silty SAND with gravel, loose, moist
		MC = 2.90%	SP		Brown poorly graded SAND with gravel, medium dense, moist -contains cobbles
5					Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. Bottom of test pit at 5.0 feet.

APPENDIX B

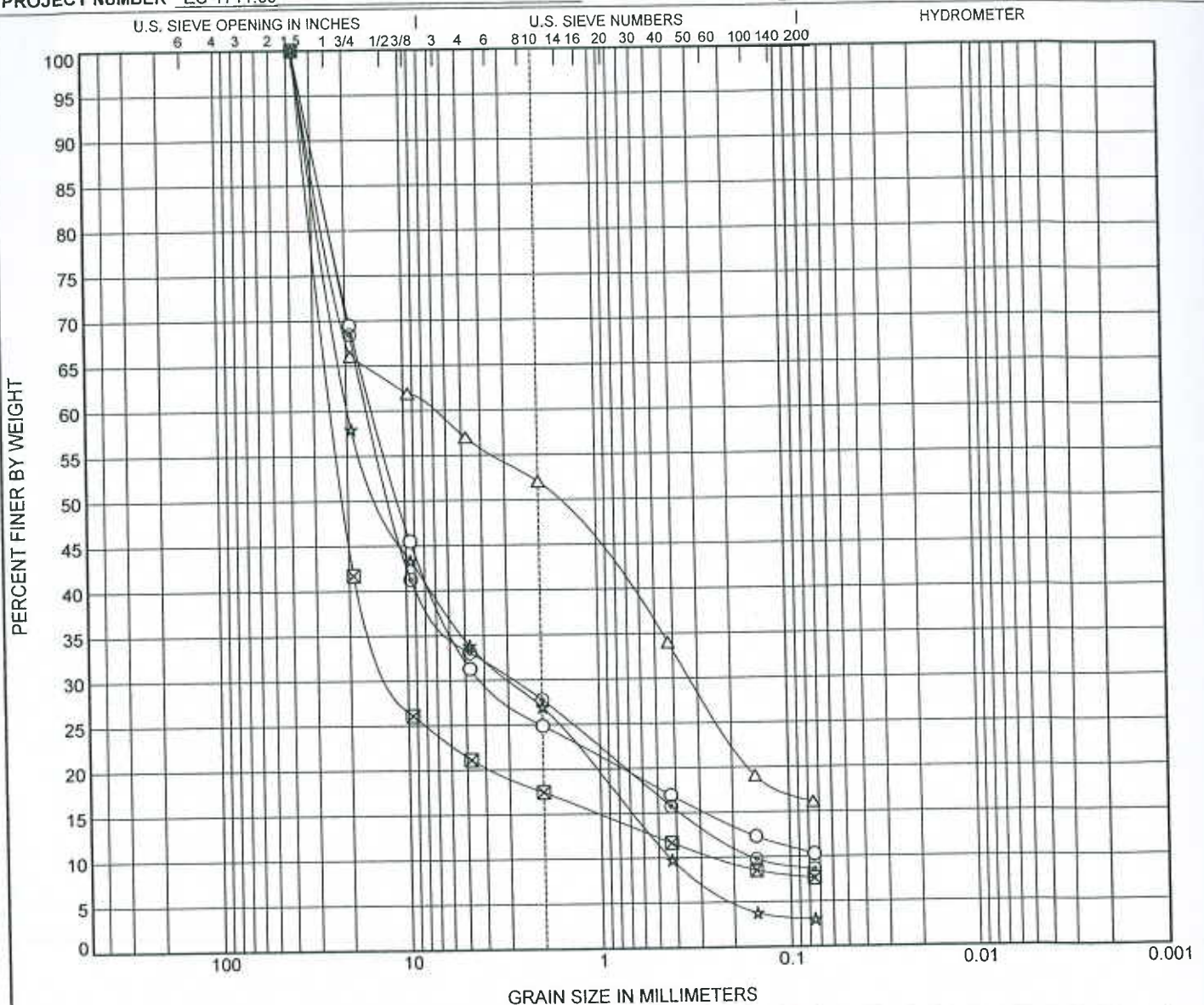
LABORATORY TEST RESULTS

ES-1711.03

GRAIN SIZE DISTRIBUTION



Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-284-3300

CLIENT Tetra Tech, Inc.PROJECT NAME Fort Lewis FY11 & FY12 MCAPROJECT NUMBER ES-1711.03PROJECT LOCATION Lakewood

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
○	TP-109	1.5ft.	Dark brown poorly graded GRAVEL with silt and sand, GP-GM						16.43	214.96
☒	TP-112	3.0ft.	Brown poorly graded GRAVEL with silt, GP-GM						22.23	96.23
△	TP-118	5.0ft.	Dark brown silty SAND with gravel, SM							
★	TP-122	6.0ft.	Brown well-graded GRAVEL with sand, GW						1.01	45.26
◊	TP-126	1.5ft.	Dark brown poorly graded GRAVEL with silt and sand, GP-GM						3.48	98.34
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
○	TP-109	1.5ft.	37.5	14.444	3.993		68.7	21.0		10.3
☒	TP-112	3.0ft.	37.5	23.516	11.302	0.244	78.9	13.5		7.6
△	TP-118	5.0ft.	37.5	7.256	0.321		43.0	40.9		16.1
★	TP-122	6.0ft.	37.5	19.639	2.934	0.434	66.2	30.8		3.0
◊	TP-126	1.5ft.	37.5	15.319	2.882	0.156	66.9	24.5		8.8

Tuesday, August 16, 2011

GRAIN SIZE ES-1711.3.GPJ GINT US LAB GDT 1/27/11



Earth Solutions NW

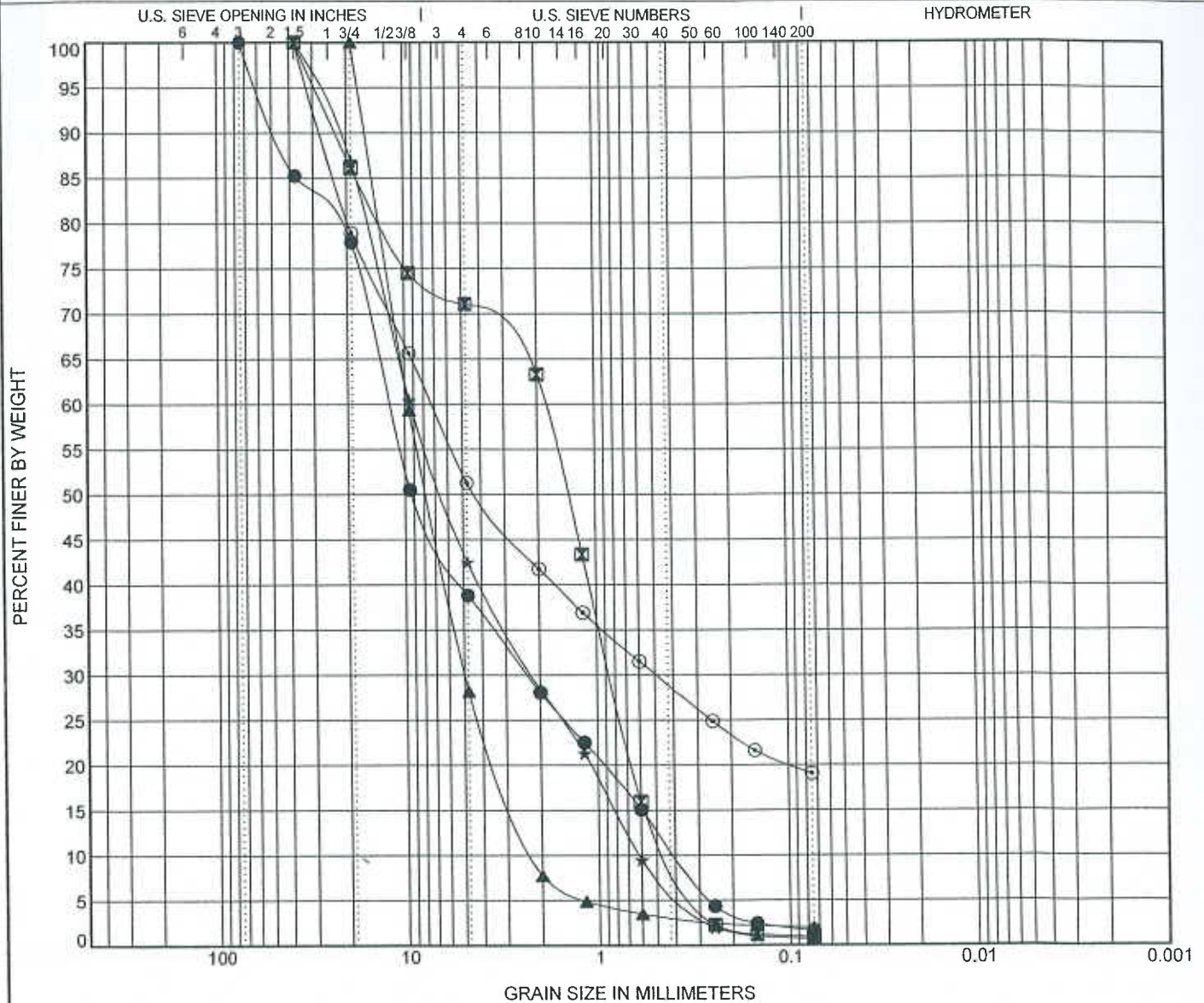
GRAIN SIZE DISTRIBUTION

CLIENT Tetra Tech, Inc.

PROJECT NAME Fort Lewis FY11 & FY12 MCA

PROJECT NUMBER ES-1711.01

PROJECT LOCATION Lakewood



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	TP-2	1.5ft.	USDA: Brown extremely gravelly coarse sand, USCS: GW						1.14	30.47
☒	TP-4	6.0ft.	USDA: Brown very gravelly coarse sand, USCS: SP						0.96	4.47
▲	TP-6	5.0ft.	USDA: Light brown extremely gravelly loamy coarse sand, USCS: GW						1.16	4.37
★	TP-9	5.0ft.	USDA: Brown extremely gravelly coarse sand, USCS: GP						0.84	15.13
◎	TP-13	2.0ft.	USDA: Dark brown very gravelly coarse sandy loam, USCS: SM							

Specimen Identification			D100	D60	D30	D10	%Silt		%Clay	
●	TP-2	1.5ft.	75	12.07	2.336	0.396	1.6			
☒	TP-4	6.0ft.	37.5	1.832	0.848	0.41	0.9			
▲	TP-6	5.0ft.	19	9.612	4.947	2.2	2.0			
★	TP-9	5.0ft.	37.5	9.342	2.207	0.617	0.7			
◎	TP-13	2.0ft.	37.5	7.229	0.491					

Tuesday, August 16, 2011

GRAIN SIZE ES-1711.1.GPJ GINT US LAB.GDT 4/21/10

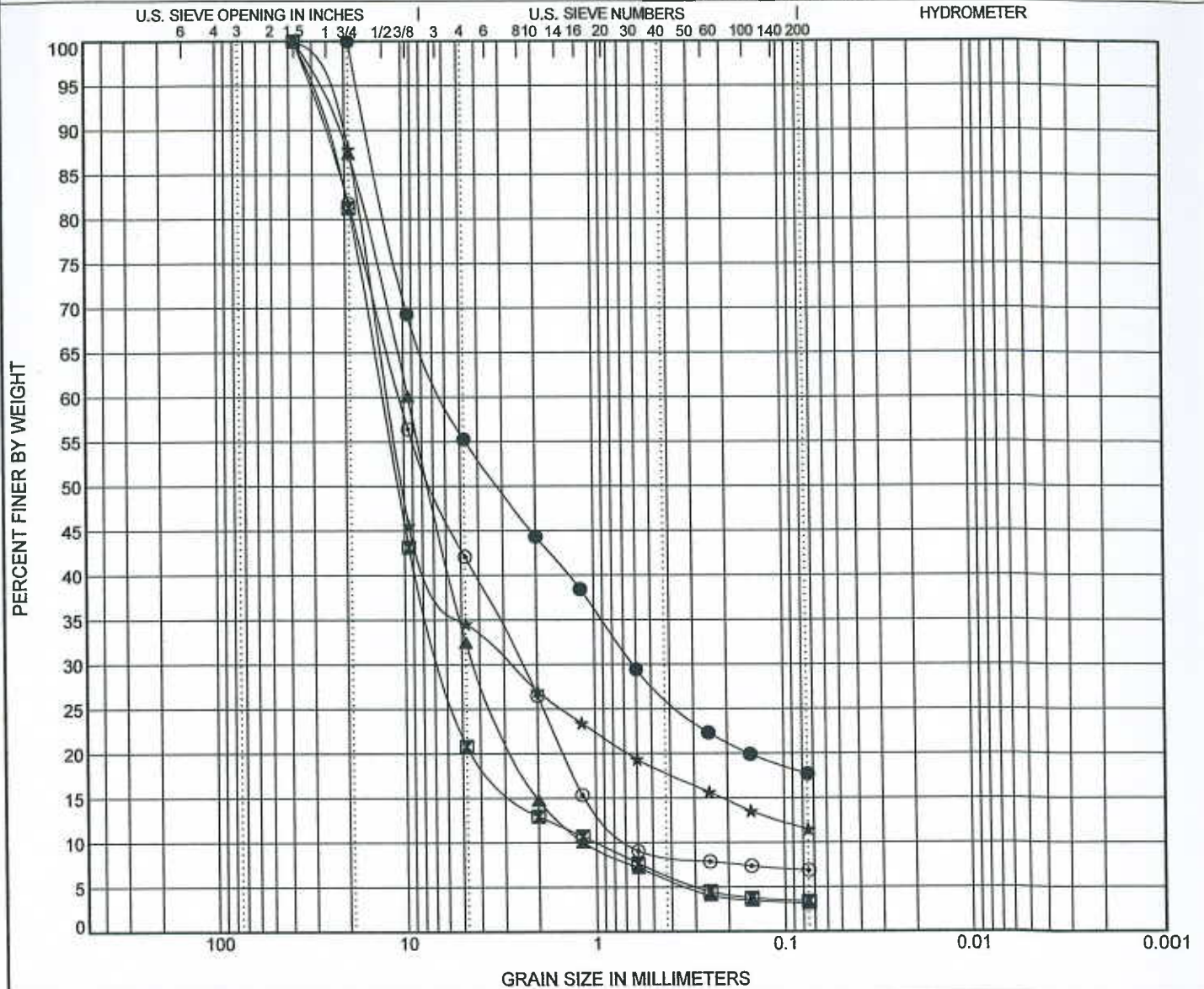


CLIENT Tetra Tech, Inc.

PROJECT NAME Fort Lewis FY11 & FY12 MCA

PROJECT NUMBER ES-1711.01

PROJECT LOCATION Lakewood



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● TP-14 3.0ft. USDA: Dark brown very gravelly coarse sandy loam, USCS: SM										
⊠ TP-15 10.0ft. USDA: Light brown extremely gravelly loamy coarse sand, USCS: GP									3.06	12.77
▲ TP-19 5.0ft. USDA: Light brown extremely gravelly loamy coarse sand, USCS: GW									1.60	8.11
★ TP-22 1.5ft. USDA: Dark brown extremely gravelly coarse sandy loam, USCS: GP-GM									14.50	264.64
○ TP-23 6.0ft. USDA: Light brown extremely gravelly loamy coarse sand, USCS: GP-GM									0.85	15.81
Specimen Identification	D100	D60	D30	D10		%Silt		%Clay		
● TP-14 3.0ft.	19	5.998	0.626					17.7		
⊠ TP-15 10.0ft.	37.5	12.909	6.316	1.011				3.4		
▲ TP-19 5.0ft.	37.5	9.47	4.211	1.168				3.1		
★ TP-22 1.5ft.	37.5	12.031	2.816					11.5		
○ TP-23 6.0ft.	37.5	10.482	2.428	0.663				6.9		

GRAIN SIZE ES-1711.1.GPJ GINT US LAB.GDT 4/21/10



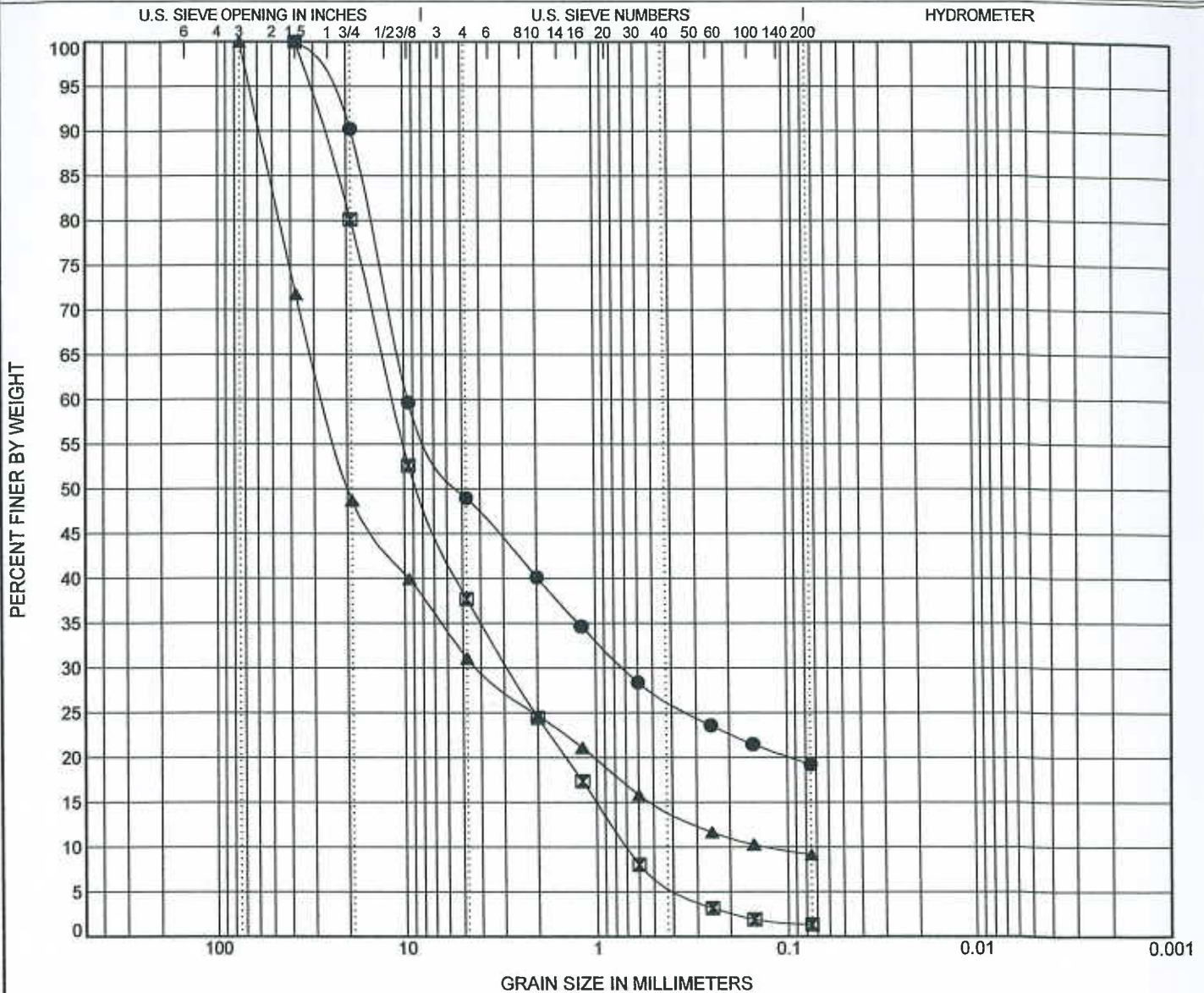
Earth Solutions NW

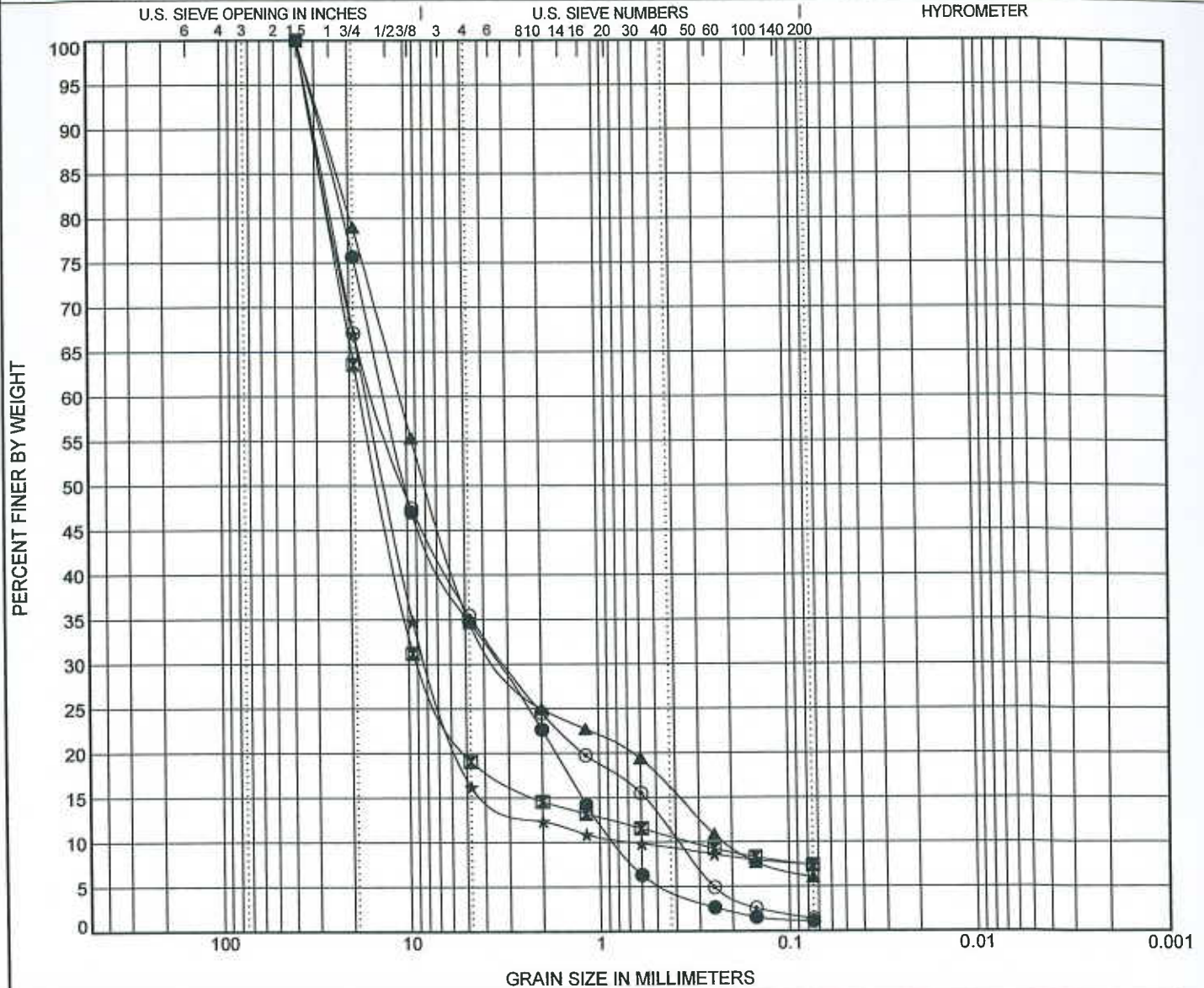
CLIENT Tetra Tech, Inc.

PROJECT NAME Fort Lewis FY11 & FY12 MCA

PROJECT NUMBER ES-1711.01

PROJECT LOCATION Lakewood



CLIENT Tetra Tech, Inc.PROJECT NAME Fort Lewis FY11 & FY12 MCAPROJECT NUMBER ES-1711.01PROJECT LOCATION Lakewood

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	TP-32	3.0ft.	USDA: Brown extremely gravelly coarse sand, USCS: GW						1.07	15.86
☒	TP-32	5.0ft.	USDA: Brown extremely gravelly loam, USCS: GP-GM						13.52	53.21
▲	TP-33	3.0ft.	USDA: Brown extremely gravelly loamy sand, USCS: GP-GM						4.17	50.21
★	TP-33	10.0ft.	USDA: Light brown extremely gravelly loam, USCS: GP-GM						5.83	24.63
◎	TP-37	3.0ft.	USDA: Brown extremely gravelly coarse sand, USCS: GW						1.69	38.84
Specimen Identification			D100	D60	D30	D10	%Silt		%Clay	
●	TP-32	3.0ft.	37.5	13.007	3.385	0.82			1.1	
☒	TP-32	5.0ft.	37.5	17.603	8.873	0.331			7.4	
▲	TP-33	3.0ft.	37.5	10.891	3.138	0.217			6.0	
★	TP-33	10.0ft.	37.5	16.337	7.948	0.663			7.5	
◎	TP-37	3.0ft.	37.5	14.787	3.083	0.381			1.4	

GRAIN SIZE ES-1711.1A.GPJ GINT US LAB.GDT 6/29/10

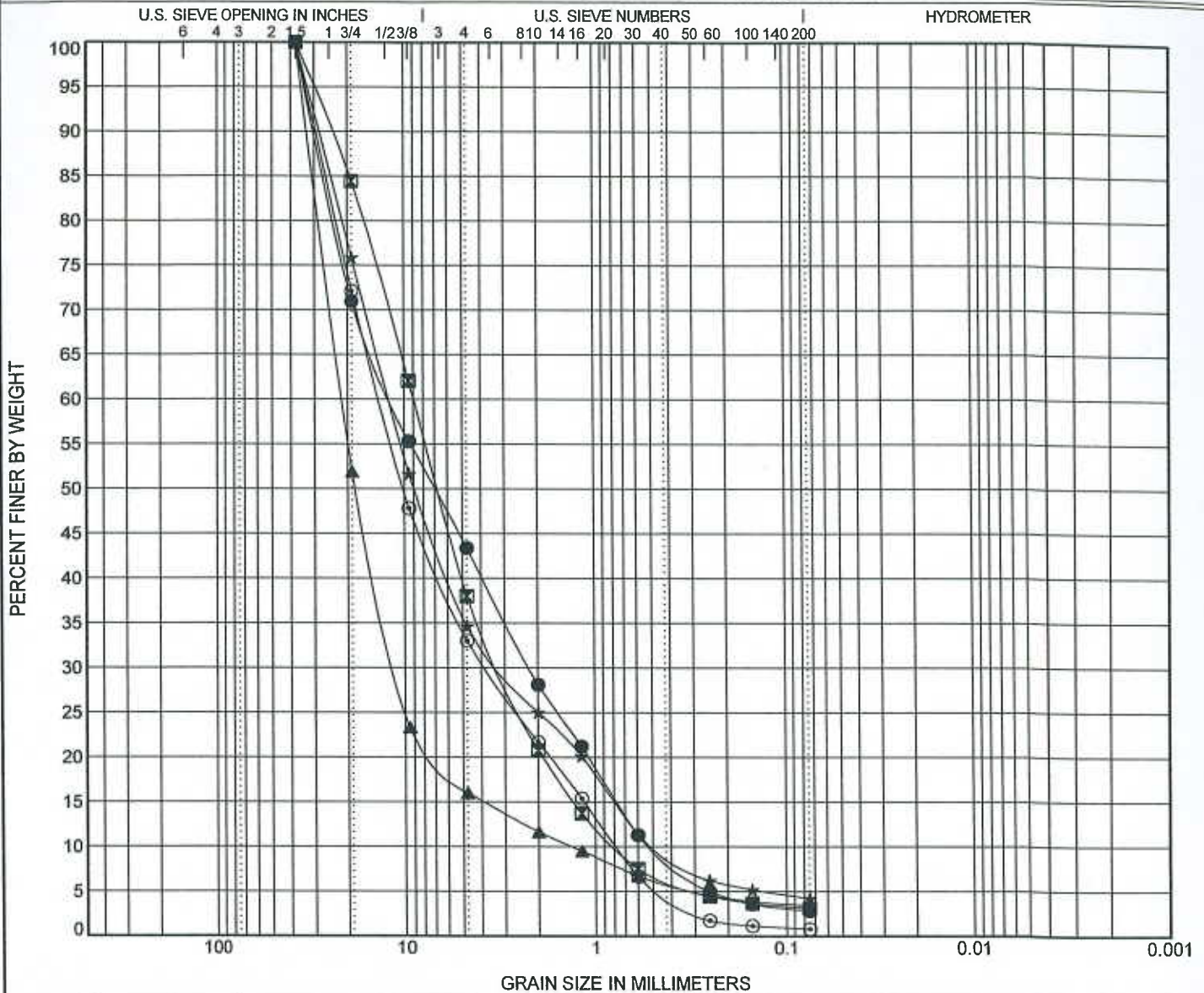


CLIENT Tetra Tech, Inc.

PROJECT NAME Fort Lewis FY11 & FY12 MCA

PROJECT NUMBER ES-1711.01

PROJECT LOCATION Lakewood



APPENDIX C
CALCULATIONS
ES-1711.03



Earth Solutions NW LLC CALCULATION SHEET

Name: Scott Riegel
 Date: 2/18/11
 Project Number: ES-1711.03
 Project Name: IBLM Ft. Lewis RLSC

Bearing Capacity Calculation (Terzaghi)

$$q_{ult} = \frac{1}{2} \gamma_t B N_\gamma + \gamma_t D_f N_q$$

$$1980 + 5940$$

$$\sim 7900 \text{ psf}$$

$$F.S. = 3$$

$$q_{all} = \frac{7900}{3} = 2640 \text{ psf}$$

use 2,500 psf.

where:

$$c = \phi$$

$$\gamma_t = 132 \text{ pcf}$$

$$B = 2'$$

$$\phi = 32^\circ \text{ (conservative)}$$

$$N_q^* = 18$$

$$N_\gamma^* = 15$$

$$D_f = 2.5'$$

* Table 4.2

Foundation Analysis & Design
Bowles, 4th Ed

REPORT DISTRIBUTION

ES-1711.03

6 COPIES

**TetraTech, Inc.
1736 Fourth Avenue South, Suite A
Seattle, Washington 98134-1502**

Attention: Mr. Bruce Johnson



ES-1711.04
March 8, 2011

Earth Solutions NW LLC

- Geotechnical Engineering
- Construction Monitoring
- Environmental Sciences

TetraTech, Inc.
1736 Fourth Avenue South, Suite A
Seattle, Washington 98134-1502

Attention: Mr. Bruce Johnson

**Subject: Geotechnical Addendum
Native Soil Suitability Evaluation
RLSC Site
JBLM Fort Lewis, Washington**

Reference: Army Corps of Engineers (ACE) Backcheck
Comment ID 3761937, Evaluation 1
Dated February 24, 2011

Earth Solutions NW, LLC
Geotechnical Engineering Study
ES-1711.03, revision dated February 18, 2011

Dear Mr. Johnson:

In accordance with the request made by Patrick Schaub of the ACE, Earth Solutions NW, LLC (ESNW) has prepared this addendum letter providing geotechnical support for using an allowable soil bearing capacity of 2,500 psf for the proposed structures to be constructed at the subject site. This addendum is based partly on the results of a phone conversation between ESNW and ACE on March 4, 2011.

Allowable Soil Bearing Capacity

In our opinion, consistent with the standard of engineering practice in our geographic area, an allowable soil bearing capacity of 2,500 psf was+ recommended in the referenced geotechnical engineering study. This parameter was determined based on the conditions observed during fieldwork, laboratory and engineering analyses and professional judgment. The professional judgment was based on the multitude of similar projects completed by ESNW with satisfactory results.

TetraTech, Inc.
March 8, 2011

An additional resource was a copy of the Final Geotechnical Report, Project No. 44795 prepared for the North Fort Lewis Whole Barracks Renewal, FY05 project dated June 23, 2004. Under Section 4c, an allowable soil bearing capacity of 192 kPa was recommended for structural fill or "the natural sandy gravel foundation". The analysis was conducted in a similar manner as the analysis provided in the referenced geotechnical report prepared by ESNW. This corresponds to about 4,000 psf which exceeds the recommendations provided in the referenced ESNW geotechnical engineering study.

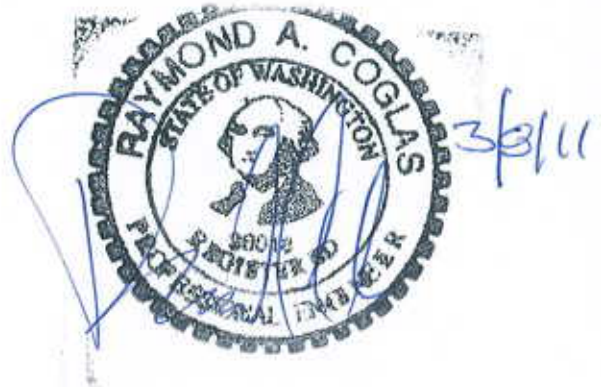
LIMITATIONS

The recommendations and conclusions provided in this letter are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. A warranty is not expressed or implied.

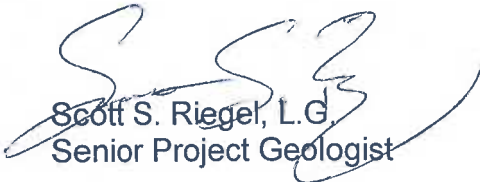
We trust this letter meets your current needs. If you have questions regarding the content of this document or require additional information, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC



Raymond A. Coglas, P.E.
Principal


Scott S. Riegel, L.G.
Senior Project Geologist

APPENDIX B – List of Drawings

DRAWING INDEX

<i>PLATE</i>	<i>TITLE</i>
G-001	Title Sheet and Index
C-100	Overall Demolition Plan (including electrical)
C-101	Demolition Plan
C-102	Site Plan
C-103	Grading Concept Plan
C-104	Utility Concept Plan
E-101	Electrical Demolition Plan
E-102	Electrical Site Plan
E-103	Electrical Site Development One-Line
E-104	Communications Site Plan

APPENDIX C – Utility Connections

Utility connections are as indicated on the drawings in Appendix 'J'.

APPENDIX D – Results of Fire Flow Tests



Sprinkler Technology Design, Inc.

2011 N. 22nd Avenue, Suite 4
Bozeman, MT 59718-2781

phone 406-582-1936

fax 406-585-8332

info@sprinklertechnologydesign.com

June 9, 2010

**Ref: Regional Logistics Support Complex
PN 72584
Flow Test
Ft Lewis, Washington
Our Job #10045**

As required by contract documentation the undersigned Fire Protection Engineer was on-site Thursday, June 1st 2010, to conduct water flow tests for the above referenced project.

Flow tests were accomplished along Tacoma Drive southeast of the proposed new facilities. The gauge hydrant was located southeast of the northeast corner of existing Building P09500. The flow hydrant was located southeast of the southeast corner of existing Building P09500. Two tests were accomplished.

Test #1: Static pressure was 63 PSI. Residual pressure was 59 PSI. Flow was accomplished utilizing a 2 ½" test nozzle with a residual pitot pressure of 40 PSI. Utilizing the test nozzle flow chart this results in a flow of 1152 GPM.

Test #2: Static pressure was 63 PSI. Residual pressure was 57 PSI. Flow was accomplished utilizing a 2 ½" test nozzle with a residual pitot pressure of 34 PSI and a 2" test nozzle with a residual pitot pressure of 27 PSI. Utilizing the test nozzle flow charts these result in flows of 1062 GPM and 857 GPM for a net flow of 1919.

John McAvoy, USACE witnessed the flow test. Jim Gustin, of Lewis-McChord Emergency Services, authorized use of fire hydrants.

Should you have additional requirements, please do not hesitate to contact us.

David R. Hughes, Jr.
Sprinkler Technology Design, Inc.

**CC: Jim Gustin -- Lewis-McChord Emergency Services
John McAvoy -- USACE
Bruce Johnson -- Tetra Tech
Mark Gouveia -- Sprinkler Technology**



"FIRE SPRINKLERS SAVE LIVES"

FLOW TEST SUMMARY

Project Number: PN72854 (Sprink Tech #10045)

Project Name: Ft. Lewis - RLSC

Date of Test: June 1, 2010

Time 9:15 AM

Conducted / Witnessed by: David Hughes - Sprinkler Technology Design

John McAvoy - USACE - (253) 966-4383

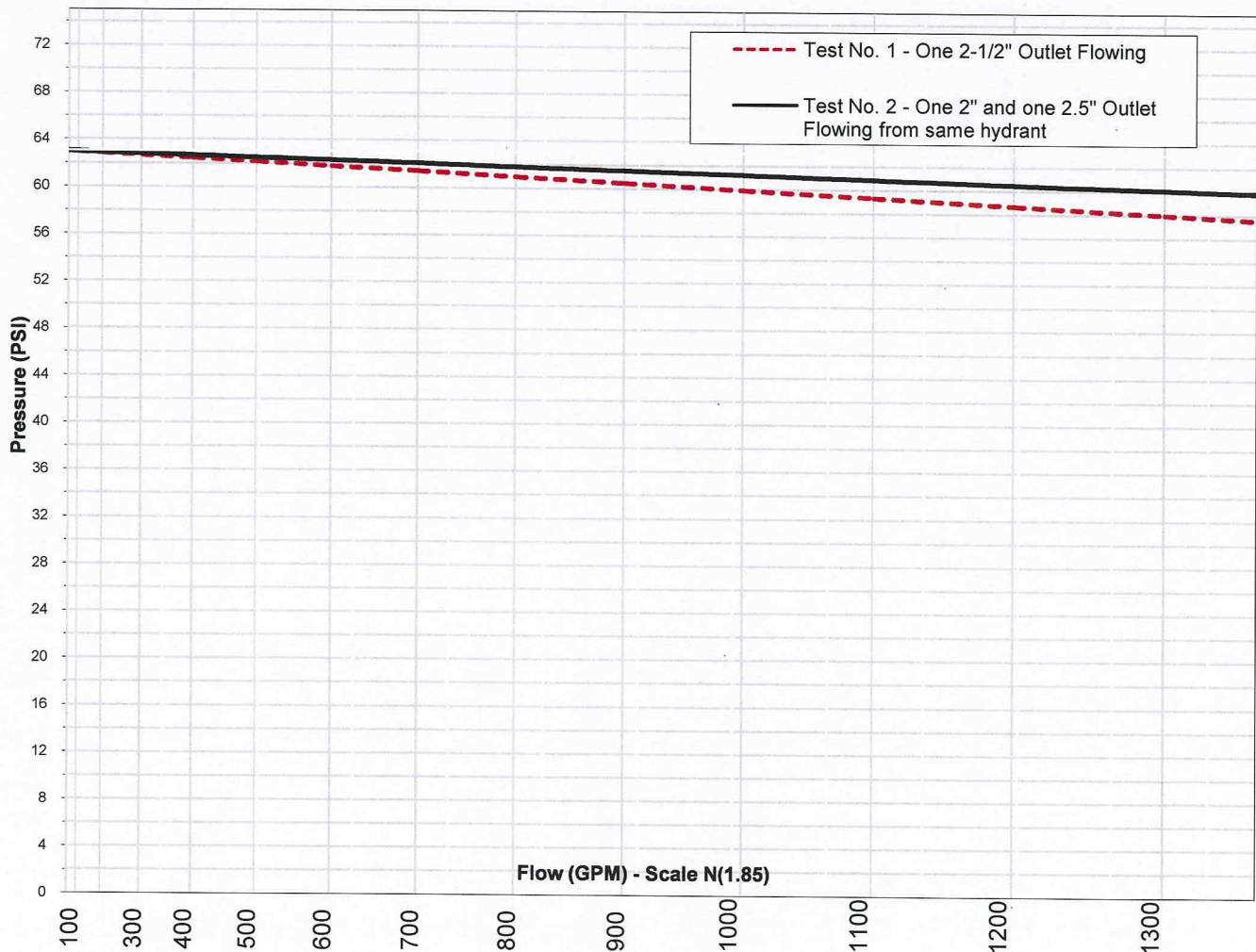
Hydrant Description: On Tacoma Drive Southeast of Site

**See the attached sketch for hydrant locations with respect to the building/hazard and underground sizes*

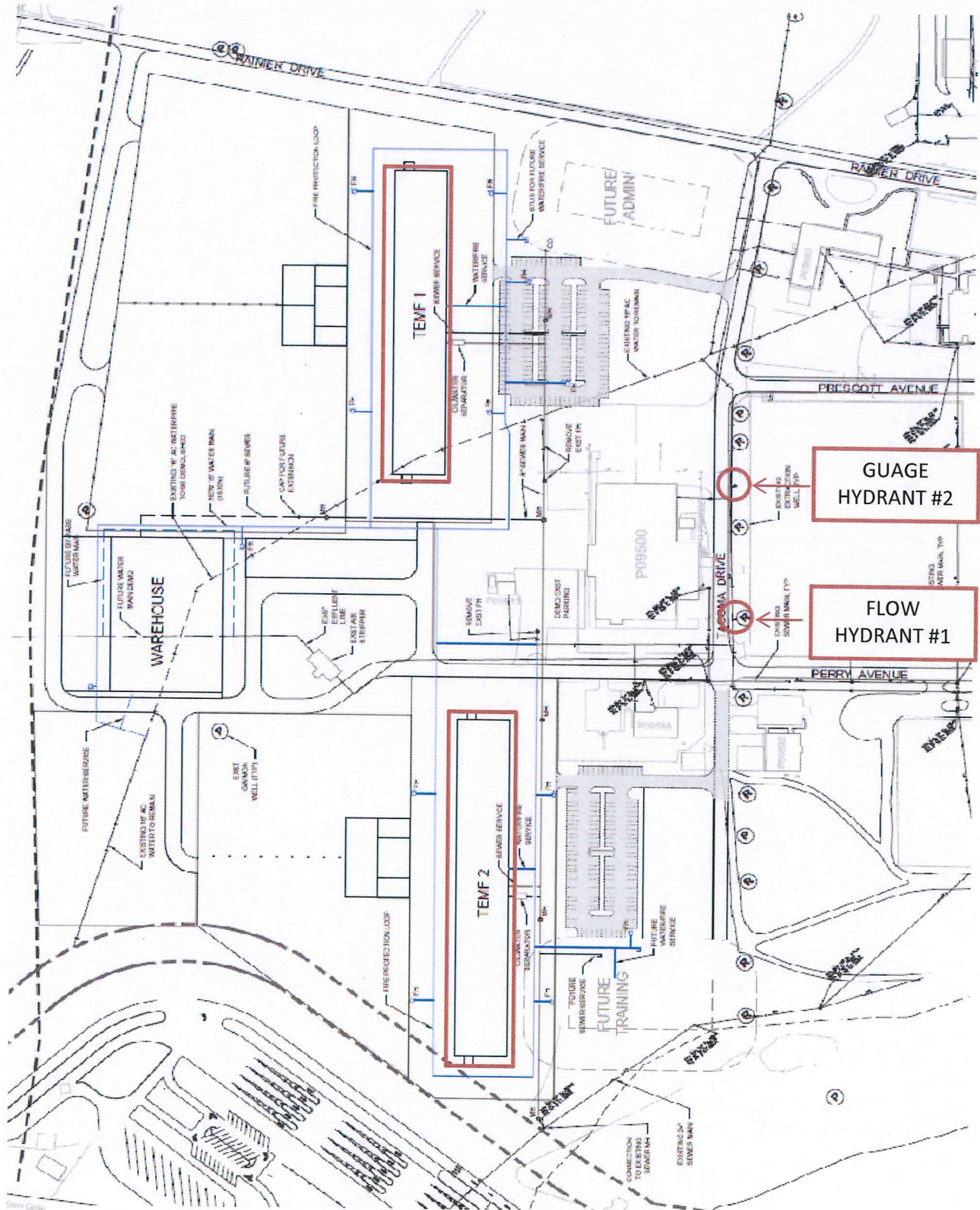
Flow at Hyd No	Static at Hyd No	Static PSIG	Residual PSIG	Adjusted flow in GPM	Pitot Guage	Outlet Coefficient	Adjusted flow in GPM at 20 PSI
Test No. 1 - One 2-1/2" Outlet Flowing							
1	2	63 PSI	59 PSI	1,152 GPM	40	2.5" Outlet*	4153
Test No. 2 - One 2" and one 2.5" Outlet Flowing from same hydrant							
1	2	63 PSI	57 PSI	1,062 GPM	34	2.5" Outlet*	3076
1	2	63 PSI	57 PSI	857 GPM	27	2" Outlet*	2482
Combined		63 PSI	57 PSI	1,919 GPM	Total Flow		5558

** No coefficient for hose master equipment.*

Flows looked up directly from manufacturer's published flow data.



FLOW TEST SUMMARY



Reference Site Plan for Flow Test

**Site Plan for reference only. Not for construction.*

APPENDIX E – Environmental Information

Record of Environmental Consideration (REC)	NEPA #: 08-PWE-074a/BV Planning/J. Carroll PNs 72838, 72839, 72840, 72854
--	---

1. Description of Proposed Action

The Army proposes to construct a Regional Logistics Support Complex (RLSC) within the Logistics Center on Joint Base Lewis-McChord (see Enclosure 1 of Environmental Survey for map of proposed construction site). This is a four phase project as follows:

Phase 1 (PN 72854):
 Construct two Tactical Equipment Maintenance Facilities (TEMFs) modified from the standard Extra Large Vehicle Maintenance Shop (VMS) designs to support vehicle maintenance/installation activities and organizational maintenance for the deployable Army Sustainment Command units. Project includes two VMS with administrative and shop control areas; welding, paint booth and overhead cranes. Organizational storage facility, waste oil tank, hazardous material and hazardous waste storage, hardstand, organizational vehicle parking, sentry station, vehicle test area, maintenance shelters, and container storage area will also be provided. This phase will also include the demolition of up to 16 buildings totaling a possible offset of 157,848 square feet.

Phase 2 (PN 72838):
 Construct a warehouse to store the reset components for organizational vehicles and equipment. Project includes a warehouse with high bay, organizational storage, and container storage area, building information systems, and connection to Energy Monitoring and Control (EMCS).

Phase 3 (PN 72839):
 Construct a facility similar to a combined Brigade and Battalion command and control facility. Primary facility includes a brigade headquarters, two battalion headquarters, and Life Cycle Management Commands (LCMCs, i.e.; TACOM [Tank Automotive Command], CECOM [Communication and Electronics Command], and AMCOM [Aviation and Missile Command]) staffs. Supporting facilities include utilities; electric service; exterior lighting; fire protection and alarm systems; paving, walks, curbs, and gutters; parking; erosion control; storm drainage; site grading and contouring; information systems; site improvements; and power distribution extension service.

Phase 4 (PN 72840):
 Construct a New Equipment Training Facility to train soldiers how to use the new equipment reset onto the BCT vehicles and equipment. Supporting facilities include utilities; electric service; exterior lighting; fire protection and alarm systems; paving, walks, curbs, and gutters; parking; erosion control; storm drainage; site grading and contouring; information systems; site improvements; and power distribution extension service.

2. Proposed Date[s] of Action: These are FY 2011 projects.

3. "Environmental Survey" Summary of Findings

- a. The EBS discloses through a database search that Clover Park Technical College (CPTC) has one or more UST's within their leased area.
- b. The site visit did not disclose any contamination issues.
- c. Contamination issues revealed by the ERP/CC Overview Map are considered as follows:
 - None of the four phases of this project include the drilling of any new drinking water wells, so the land use control (LUC) to prevent this activity should not be a problem. The up gradient landfill leaked contamination into the soil and ground water and is the source of a groundwater contamination plume underlying the construction/operation site.
 - In addition, a LUC exists to prevent this area from being zoned for and the construction of any residential land use.
 - The 30+ monitoring wells within the footprint are active and must be conspicuously marked prior to construction so that they do not incur any damage during construction.
- d. The MPEO discloses the CPTC leased property, the locations of the groundwater monitoring wells, the former cannibalization yard, the battery acid pit, and the AOC #8 buildings.
- e. GIS maps show no new and/or different types of contamination issues in the proposed building area.

4. Categorical Exclusion or covered in an existing EA/EIS.

- a. Project is next to Interstate 5 (I-5) where noise exceeds 87 dB as depicted by the red lines which parallel either side of the interstate in Enclosure 1. If clear communication is a requirement of personnel working at this facility, then 'noise level reduction' construction materials should be incorporated into the design of the facilities. Installation of noise dampening windows, designing thicker insulated exterior walls, and using noise dampening wallboard are some examples of noise reduction techniques. Designing the layout of the facilities could also attempt to place noise sensitive work activities away from the interstate.

- b. The design of the facilities and associated infrastructure must incorporate the monitoring and extraction wells.
- c. Oak tree clusters within the project boundary must be preserved and incorporated into the design. No exceptions. (See ES Figure 1.)
- d. Logistics Center Gate. This structure is eligible for listing on the National Register of Historic Properties. Therefore the historic significance must be addressed during design and must be protected from damage during construction. This is also true for building 9503.

Project is categorically excluded, having no significant individual or cumulative environmental impacts, under title 32 CFR Part 651, Appendix B. Cat Ex: *Construction exclusion (c)(1)*. Although this project site exceeds 5 acres, the entire site has been previously disturbed.

5. Compliance Screening		
a. Endangered Species, Fish & Wildlife, Wetlands <i>Dave Clouse</i> <i>2 Feb. 2010</i>		
Tab J insert:	<input checked="" type="checkbox"/> T-1 <input type="checkbox"/> T-2	
		Dave Clouse, Fish & Wildlife Program Manager date
b. NHPA, NAGPRA, & AIRFA <i>33</i> <i>1 JUN 2010</i>		
Tab J insert:	<input type="checkbox"/> C-1 <input checked="" type="checkbox"/> C-2	
		Dr. Bret Ruby, Cultural Resources Program Manager date
c. Clean Water		
Tab J insert:	<input checked="" type="checkbox"/> W-1 <input checked="" type="checkbox"/> W-2 <input checked="" type="checkbox"/> W-3 <input checked="" type="checkbox"/> W-4 <i>Joe Gibbens</i> <i>1-27-10</i>	
		Joe Gibbens, Water Program Manager date
d. Clean Air		
Tab J insert:	<input type="checkbox"/> A-1 <input type="checkbox"/> A-2 <i>Tom Olsen</i> <i>1-27-10</i>	
		Tom Olsen, Air Program Manager date
e. P2 & Hazardous Materials <i>P1 P2 P3</i> <i>1/27/10</i>		
		Terry Austin, Hazardous Materials Program Manager date
f. RCRA-C & RCRA-D		
Tab J insert:	<input checked="" type="checkbox"/> R-1 <i>Ken Smith</i> <i>28 Jan 10</i>	
		Ken Smith, Solid & Hazardous Waste Program Manager date
g. Environmental Restoration Program		
Tab J insert:	<input checked="" type="checkbox"/> E-1 <input checked="" type="checkbox"/> E-2 <input type="checkbox"/> E-3 <input checked="" type="checkbox"/> E-4 <i>James Gillic</i>	
		James Gillic, Restoration Task Lead date

6. Approval	
a. Environmental Evaluator	<i>William Van Hoesen</i> William Van Hoesen, NEPA Program Manager
b. Staff Concurrence	<i>Paul T. Steucke Jr.</i> <i>15 June 2010</i> Paul T. Steucke Jr., Chief, Environmental Division date

7. Proponent/Project Officer	
<i>Caveat with this NEPA document: Any change in the magnitude, location, duration, or timing of this project will require re-evaluation and possible revised documentation by the proponent with the Public Works, Environmental Division NEPA coordinator (253 966-1780).</i>	
name / organization	phone/date

8. Document History
NEPA tracking #: 08-074 for PN 70431 (original PN for this facility before it was split into 4 phases).

9. Provisions
Clean Air
A-1: Asbestos-containing material (ACM) & lead-based paint (LBP) Construction, demolition, and/or renovation have the ability to encounter asbestos-containing material and/or lead-based paint. Even site scarification and grubbing can encounter underground piping that contains asbestos. Sites may have soils containing lead paint chips from previously demolished buildings that require different handling and

disposal techniques. This project will require contacting the PW toxics substances program manager to understand and implement the appropriate statutory procedures for handling these two substances. Call either (253) 966-1775 or 966-1776.

A-2:

Radon mitigation techniques will be incorporated in construction plans to prevent excessive radon migration into new structures (per AR 420-1, H-24). Contact the Air program for assistance at (253) 966-1776.

NHPA, NAGPRA, AIRFA

C-1:

In the event that human remains, artifacts, or features of archaeological interest are inadvertently discovered, the contractor shall immediately cease activity in the vicinity of the discovery, stabilize and protect such discoveries from further disturbance or public disclosure, and provide immediate notice (within 24 hours following discovery) by telephone and email to the Installation Cultural Resource Manager and Contracting Officer's Representative. Work may not proceed in the vicinity of the discovery until authorized to proceed by the Installation Cultural Resource Manager and the Contracting Officer's Representative. The installation Cultural Resource Manager's phone number is (253) 966-1785, or if not available, try (253) 966-1769 or 966-1781. The manager's email is "bret.ruby@us.army.mil".

C-2: Affect on Historic Properties

There are many historic districts, sites, buildings, structures, objects, and landscapes at Joint Base Lewis-McChord [or other locations as appropriate] that may be listed or eligible for listing in the National Register of Historic Places. The District Project Manager must consult with the Installation Cultural Resource Manager [(253) 966-1785] to determine whether historic properties will be affected. When projects affect historic properties, all work must comply with: "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings" (available at <http://www.cr.nps.gov/hps/tps/standguide/>); the "Maintenance and Repair Manual for Historic Structures"; the "Landscape Development Plan - Volume II"; and the "Installation Design Guide" (documents available at <http://www.lewis.army.mil/publicworks/> - click on "Design Standards," "Go to Design Standards," and "Reference Manuals"). All work affecting historic properties must be reviewed and approved in advance by the Installation Cultural Resource Manager. The District Project Manager is advised to plan for a minimum 45-day review period to allow for consultation with the State Historic Preservation Officer (SHPO).

Clean Water

W-1: Stormwater Pollution Prevention Plan

Any construction activity that will, or is part of a "common plan" of development or sale that will, disturb one or more acres and has the potential to have a discharge of stormwater to a water of the United States either directly or through a conveyance, must submit two copies of a project specific Stormwater Pollution Prevention Plan (SWPPP) in accordance with the EPA's NPDES General Permit for Stormwater Discharges from Construction Activities. One copy will be retained by the Joint Base Lewis-McChord Stormwater Compliance Lead. The SWPPP must receive Government approval prior to the initiation of land disturbing activities. An erosion control plan shall not be substituted for a SWPPP when permit coverage is required. Primary POC can be contacted at (253) 966-1795 and alternate at (253) 967-2837.

W-3: Stormwater Underground Injection

Projects that intend to use underground injection control for stormwater management must meet the requirements of Chapter 173-218 WAC, Underground Injection Control Program. Completed registrations forms shall be submitted to the Joint Base Lewis-McChord Stormwater Office for registration with the Washington State Department of Ecology prior to any UIC facilities being placed into service. Registration forms and further information can be obtained by contacting the Joint Base Lewis-McChord Stormwater Office, building 2012, room 321. Primary POC can be contacted at (253) 966-1795 and alternate at (253) 967-2837.

W-4: Stormwater Techniques

Stormwater management techniques for new development and redevelopment projects shall be designed and constructed in accordance with the most recent version of the Washington State Department of Ecology's Stormwater Management Manual for Western Washington. Stormwater management techniques applied in accordance with the Manual should result in compliance with existing regulatory requirements for stormwater. Use of Low Impact Development techniques is preferred. Primary POC can be contacted at (253) 966-1795 and alternate at (253) 967-2837.

Environmental Restoration Program

E-2:

The proposed project is located near monitoring wells (MWs) or extraction wells (EWs) owned and operated by the Joint Base Lewis-McChord Environmental Restoration Program/Compliance Cleanup Program. Please contact the program lead (Jim Gillie, (253) 966-1774, james.gillie@us.army.mil) regarding the location of your project relative to the MWs and/or EWs as well as any specific protective measures you will need to take. In general, MW/EWs should be clearly marked by you so that your construction activities do not damage the wells. If you are doing any grading or filling, it may be necessary for you to hire a well driller licensed in Washington to extend the well casing to new ground surface.

Pollution Prevention, EPCRA, Sustainability

P-1

Facilities utilizing petroleum, oils, and lubricants (POL). Project design should ensure that:

1. POL tanks are in secondary containment via double-wall construction or placed within a secondary containment structure.
2. POL lines will not be run below grade in pits or under floors of maintenance facilities; they will be run overhead.
3. POL lines should connect with bulk tanks to deliver fresh product directly to maintenance bays.
4. Bulk tanks for products with large quantity throughput are more cost effective and can be hooked into an air operated delivery system.
5. Recovery of waste product should be accomplished through the use of fluid collection caddies that connect to air operated pumps that deliver waste product directly to recycling collection tanks.
6. There is no overriding reason to include maintenance or inspection pits in maintenance facilities – undercarriage inspection can be carried out via ramps or lifts.

Primary POC is Terry Austin at (253) 966-6463.

Environmental Survey (ES)

NEPA #: 08-PWE-074a/BV
Planning Division/J. Carroll:
PNs 72838, 72839, 72840, 72854

1. Fiscal Year: 2011 (all PNs)

2. Name of Facilities: Regional Logistics Support Complex

3. Description of the Proposed Action

The Army proposes to construct a Regional Logistics Support Complex (RLSC), formerly titled the Logistics Support Center, to include two vehicle maintenance shops, two organizational storage facilities, a Hazmat/Hazwaste storage area, a military vehicle parking area, a hardstand, a general purpose warehouse, a container storage area, three POV/GSA parking lot areas, an administration facility and an equipment training facility. The RLSC will be located in the Logistics Center on a previously disturbed site where the historic Logistics Center gate stands. Clover Park/Bates VoTec (Vocational/Technical) buildings on the premises may be demolished/moved prior to the start of this construction. This project is divided into four phases and assigned Project Numbers 72854, 72838, 72839, and 72840.

4. Contamination Assessment Sources

- a. A review of the 2001 Environmental Baseline Survey (EBS) for Fort Lewis (attached on CD).
- b. Site visit by Bill Van Hoesen on 05 January, 2010.
- c. Review of the Fort Lewis Environmental Restoration Program/Compliance Clean-up (ERP/CC) Overview Map dated November 12, 2007 displayed in hallway of building 2012, third floor.
- d. Review of the 2009 Master Planning Environmental Overlay (MPEO) for the Log Center area (attached).
- e. Review of the installation GIS database.

5. Findings:

- a. The EBS does not disclose any areas of contamination within the project boundaries; however, there are several potentially contaminated facilities/areas near the site. Refer to RCRA Facility Assessment SWMU & AOC Map sheet 2 of 4 (bldg 2012, rm 323).
 - EBS site #9 is building 9507, a former PCB and transformer storage facility. Between the 1970s and the 1990's, PCB-contaminated anchor chain received from the Navy, and PCB-containing electrical transformers were stored in the building. Bldg was demolished on or about 01 May 2001.
 - EBS site #16 is a known former cannibalization point southeast of building 9502.
 - EBS Landfill #6 is also located southeast of building 9502. It is a .5 acres area used for sludge disposal up to 1981. It is unknown what contaminants, including their concentrations, may be in the landfill.
 - A UST data search for the EBS resulted in Table 3-5 in the document and did discover Clover Park Technical College (CPTC) underground storage tanks (USTs) on the Fort Lewis leased property. CPTC may be required to remove the tanks prior to lease termination. This would include the excavation of any contaminated soil and any necessary remediation actions.
- b. The site visit revealed no contamination issues.
- c. Review of ERP/CC Overview Map confirms that there are several contamination issues in the vicinity of the construction footprint.
 - One Land Use Control (LUC) is in effect for the entire site: prevent new drinking water wells and prevent residential land use.
 - Landfill #6 is southeast of build site (see EBS discussion above).
 - Area of Concern (AOC) #9 is just to the west of the site.
 - AOC #8 (two locations) is just to the east of the site.
 - A "Former Cannibalization Yard" is just to the south of the site.
 - Solid Waste Management Unit #51 is to the south of the site in building 9580.
 - A battery acid pit is also located to the southeast of the site.
 - There are about 30 groundwater monitoring wells within or near the construction boundaries for this project.
- d. Review of the MPEO confirms the contamination sources identified by the EBS and ERP/CC Overview Map and no additional sources were identified.
- e. The GIS database confirms the actual or potential sources revealed by the other sources listed above and shows no new or different issues of concern regarding the project site.

6. Summary of Findings:

- a. The EBS discloses through a database search that CPTC has one or more UST's within their leased area.

- b. The site visit did not disclose any contamination issues.
- c. Contamination issues revealed by the ERP/CC Overview Map are considered as follows:
 - None of the four phases of this project include the drilling of any new drinking water wells, so the land use control (LUC) to prevent this activity is not invoked. The landfill up gradient leaked contamination into the soil and ground water and is the source of a groundwater contamination plume underlying the construction/operation site.
 - In addition, a LUC exists to prevent this area from being zoned for and the construction of any residential communities.
 - The 30+ monitoring wells within the construction footprint are active and must be conspicuously marked prior to construction so that they do not incur any damage. (see provisions included with the REC for further direction).
- d. The MPEO discloses the CPTC leased property, the locations of the groundwater monitoring wells, the former cannibalization yard, the battery acid pit, and the AOC 8 buildings.
- e. GIS maps show no new and/or different types of contamination issues in the proposed building area.

7. List of permits/clearances required for human health safety and environmental protection.

Secure and complete a digging permit application. Start process at bldg 2044, door 3.

8. Construction site categorization: (AR 415-15, Appendix C-2e)

- a. *The garrison commander is responsible for the environmental survey including an unexploded ordnance survey, and associated documentation of a proposed MILCON or NAF construction site before site selection. The IMA region director is responsible for certifying the site categorization.*
- b. Sites are classified into the three following categories:
 1. Category I: There is no reason to suspect contamination will be encountered during construction.
 2. Category II: There is no known contamination; there remains some potential that contamination may be encountered during construction.
 3. Category III: The site is known to be contaminated or there is a strong suspicion contamination will be encountered during construction.

Project location(s)	Category code	Reason for code
In the Logistics Center on land between Interstate 5 and building 09580.	II	There is no known contamination; there remains some potential that contamination may be encountered during construction and/or demolition. There is a chance contamination may be encountered as this site was part of the Mt. Rainier Army Depot where ordnance was transported, stored, processed, and disposed of.

9. Survey assessment concurrence

a. Prepared by Bill Van Hoesen, NEPA Program Manager

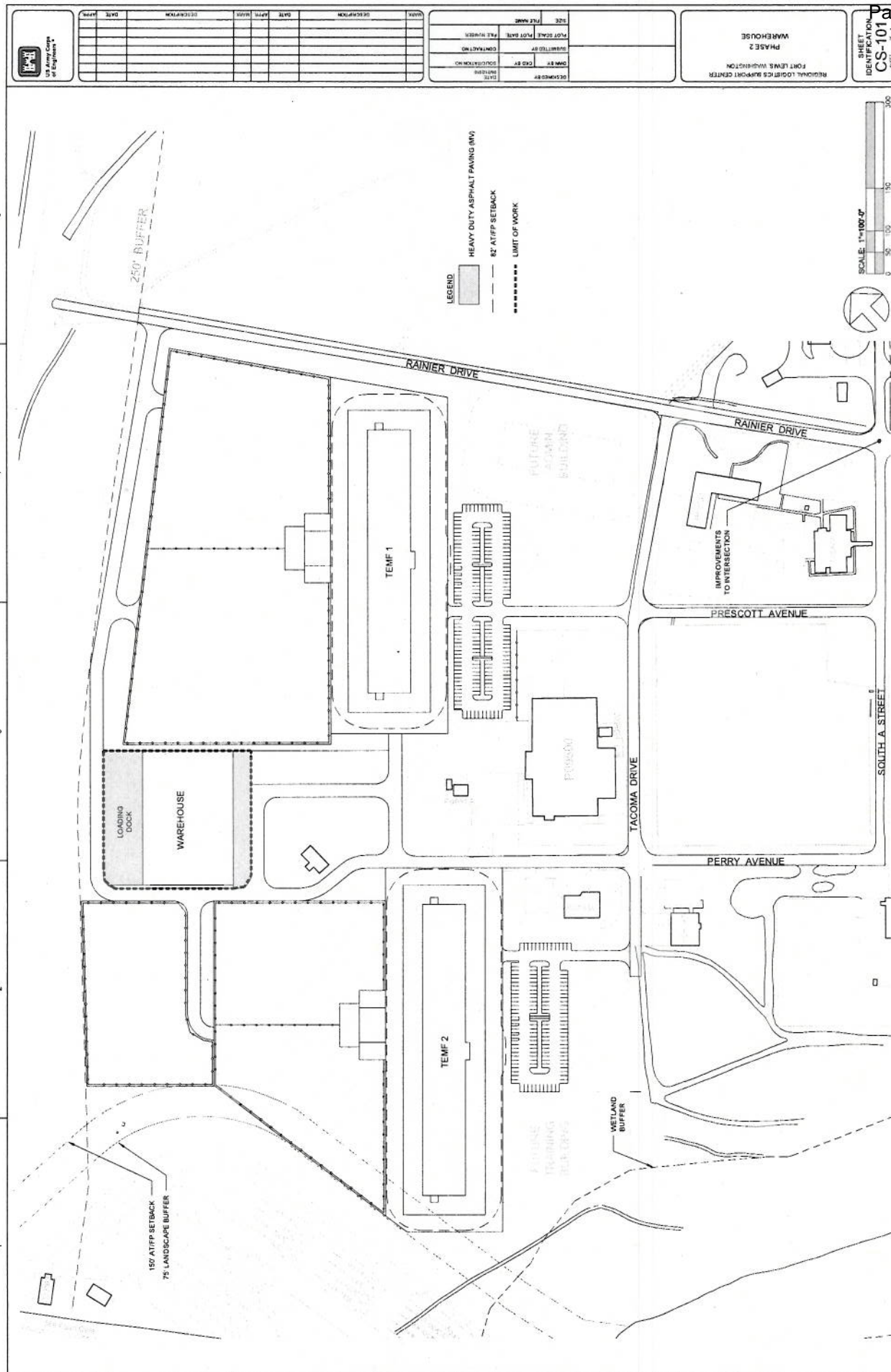
b. Reviewed and concurred on by:

Paul T. Steucke, Jr., Chief, Environmental Division, PW

date

Randall W. Hanna, Deputy Director of Public Works

date





STATE OF WASHINGTON
DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501

Mailing address: PO Box 48343 • Olympia, Washington 98504-8343

(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

May 25, 2010

Regional Support + Logistic Center (RSLC)

Dr. Bret J. Ruby, Ph.D.
Installation Cultural Resource Manager
Joint Base Garrison
Public Works
ATTN: AFZH-PWE MS 17E (Ruby)
Post Office Box 339500
Joint Base Lewis-McChord, Washington 98433-9500

PN 72854

PN 72838

PN 72839

PN 72840

In future correspondence please refer to:

Log: 052510-01-DOA

Property: Fort Lewis Logistics Center Gate

Re: Building Construction & Vehicle Storage Hardstands

Dear Dr. Ruby:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. My review is based upon documentation contained in your communication.

I concur that the current project as proposed will have "NO ADVERSE EFFECT" on the National Register eligible property. If additional information on the project becomes available, or if any archaeological resources are uncovered during construction, please halt work in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Please note that DAHP requires that all historic property inventory and archaeological site forms be provided to our office electronically. If you have not registered for a copy of the database, please log onto our website at www.dahp.wa.gov and go to the Survey/Inventory page for more information and a registration form. To assist you in conducting a survey, DAHP has developed a set of cultural resource reporting guidelines, a copy of which you can obtain from our website. Finally, please note that effective Nov. 2, 2009, DAHP requires that all cultural resource reports be submitted in PDF format on a labeled CD along with an unbound paper copy. For further information please go to http://www.dahp.wa.gov/documents/CR_ReportPDF_Requirement.pdf.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Stephen A. Mathison

Historical Architect

(360) 586-3079







stephen.mathison@dahp.wa.gov

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION





Protect the Past, Shape the Future

Tuesday, August 16, 2011

















SAFETY ZONE

-  Bldg 4061 Hazardous Chemical Storage Area
-  High Tension Power Line
-  Airfield Linear Safety Feature Line
-  APZ II
-  APZ I
-  CLEAR ZONE

UNDERGROUND HAZARDS/LIMITS

-  Code 3 Tank Locations
-  Wellhead Protection Area
-  Underground Storage Tank (permitted)
-  Logistics Center NPL Site (ground water contamination plume)

ABOVEGROUND LIMITING FACTORS

-  Cell Tower
-  Well (Monitoring)
-  Well (Drinking Water)
-  Well Buffer, 100ft (Drinking Water)
-  Borrow Pit Area
-  Outgrant Area (Housing, Schools)
-  Outgrant Area
-  Surface Danger Zone Area
-  Live Fire Ranges
-  ASP
-  Dudded Impact Area
-  Non-dudded Impact Area
-  Training Areas
-  EQSD Arcs
-  Stormwater Stilling Basin
-  Proposed Cross Base Highway





Installation Compatible Use Zone - 1995 (Noise Contours)
Maximum Level Decibel Quantity

-  62
-  65
-  70
-  75



SURFACE HAZARDOUS & TOXIC DISPOSAL AREAS

-  Stormwater Outfall Point




CERCLA Sites

-  Further Investigation and/or Action Required
-  Remedy Implemented; Maintenance of Institutional Controls Only Remaining Required Action
-  Remedy Implemented; Long-Term Monitoring & Maintenance of Institutional Controls Only Remaining Required Action
-  No Further Action Required (No Land Use Restrictions)






Institutional Control Extent

-  Land use planning institutional control(s) required
-  Groundwater use planning institutional controls required

RCRA Sites

-  Further Investigation and/or Action Required
-  Former Range in Active Training Area
-  Landfill

NATURAL RESOURCES

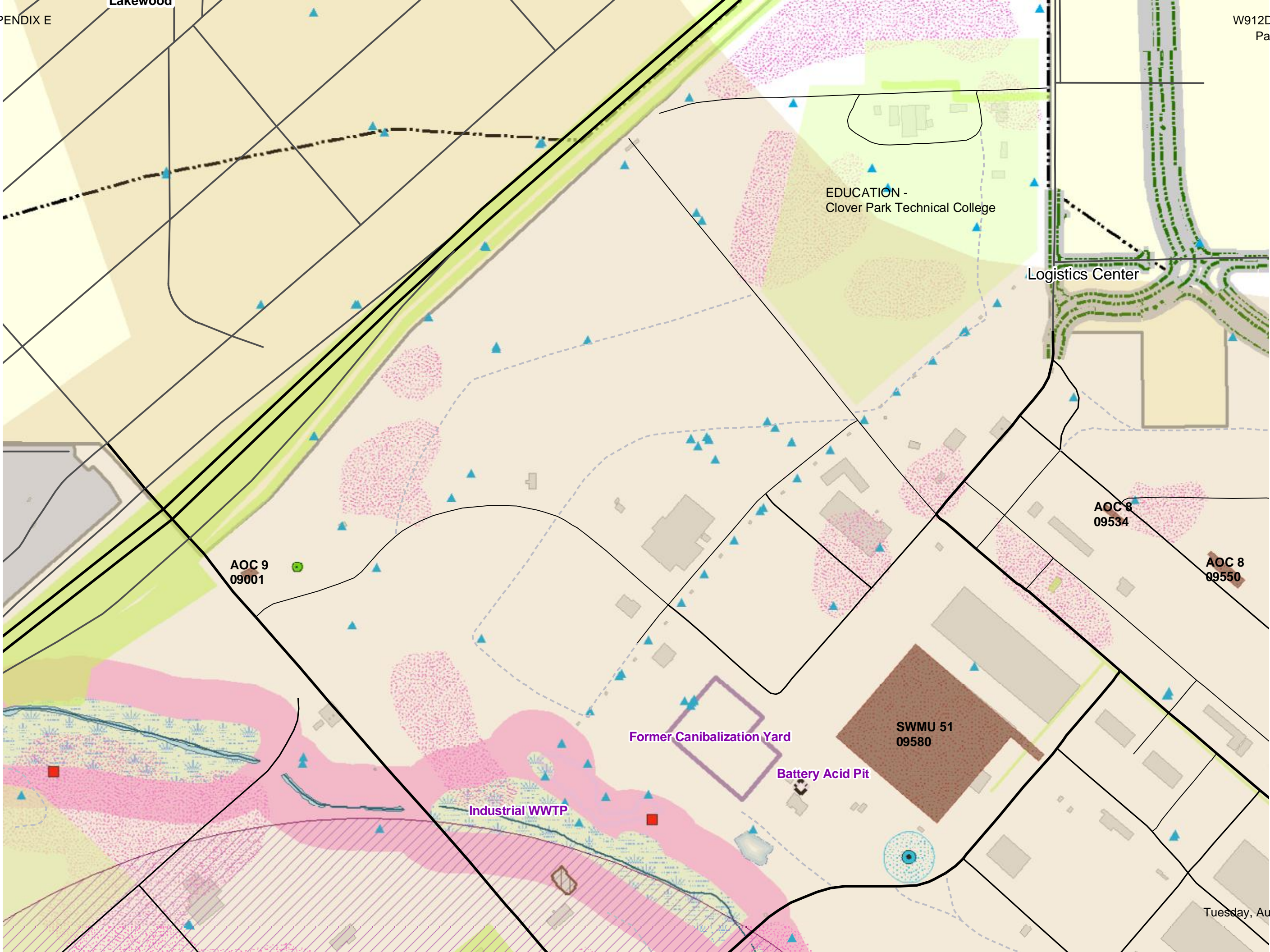
-  High Value Trees
-  Bald Eagle Mgt Zone (400 m buffer of nest)
-  Historic District Area
-  Oak Habitat
-  Wetlands w/50m Buffer

CULTURAL AREAS - Not shown, consult with CR Manager.**AR 210-20 Section 3-5**

b. Environmental overlays. Environmental overlays will cover the installation and surrounding areas. Portrayed data will not be effective unless a regional perspective is portrayed. The environmental overlays will graphically demarcate and denote all areas in which development should be limited or should not occur at all. The overlays will portray environmentally sensitive areas on or near the installation that may be affected by installation operations or development. The environmental overlay data will be integrated with the range complex master plan operational overlay. The environmental overlay is part of the LRC. Because some of the information is likely to be sensitive, garrison security personnel will review the document for suitability of public release. Typical environmental overlay data layers include but are not limited to:

- (1) Threatened and endangered species
- (2) Danger zones
- (3) Flood plains
- (4) Wetlands
- (5) Surface & subsurface hazardous material storage or contaminated areas
- (6) Pesticide storage areas
- (7) Pesticide sensitive application facilities & areas
- (8) Former firing ranges and impact areas
- (9) LUCs
- (10) Ammunition and chemical storage areas
- (11) Safety buffers
- (12) Noise contours
- (13) Low altitude aircraft operation corridors
- (14) Quantity safety distances for storage of explosives
- (15) Areas proposed for disposal/deconstruction
- (16) Desirable and undesirable land use features off the installation
- (17) Open/closed landfills
- (18) Cultural resources/archeological sites

Tuesday, August 16, 2011



2010 Master Planning Environmental Overlay

SAFETY ZONE

UNDERGROUND HAZARDS/LIMITS

ABOVEGROUND LIMITING FACTORS

Installation Compatible Use Zone - 1995 (Noise Contours)

SURFACE HAZARDOUS & TOXIC DISPOSAL AREAS

CERCLA Sites

Institutional Control Extent

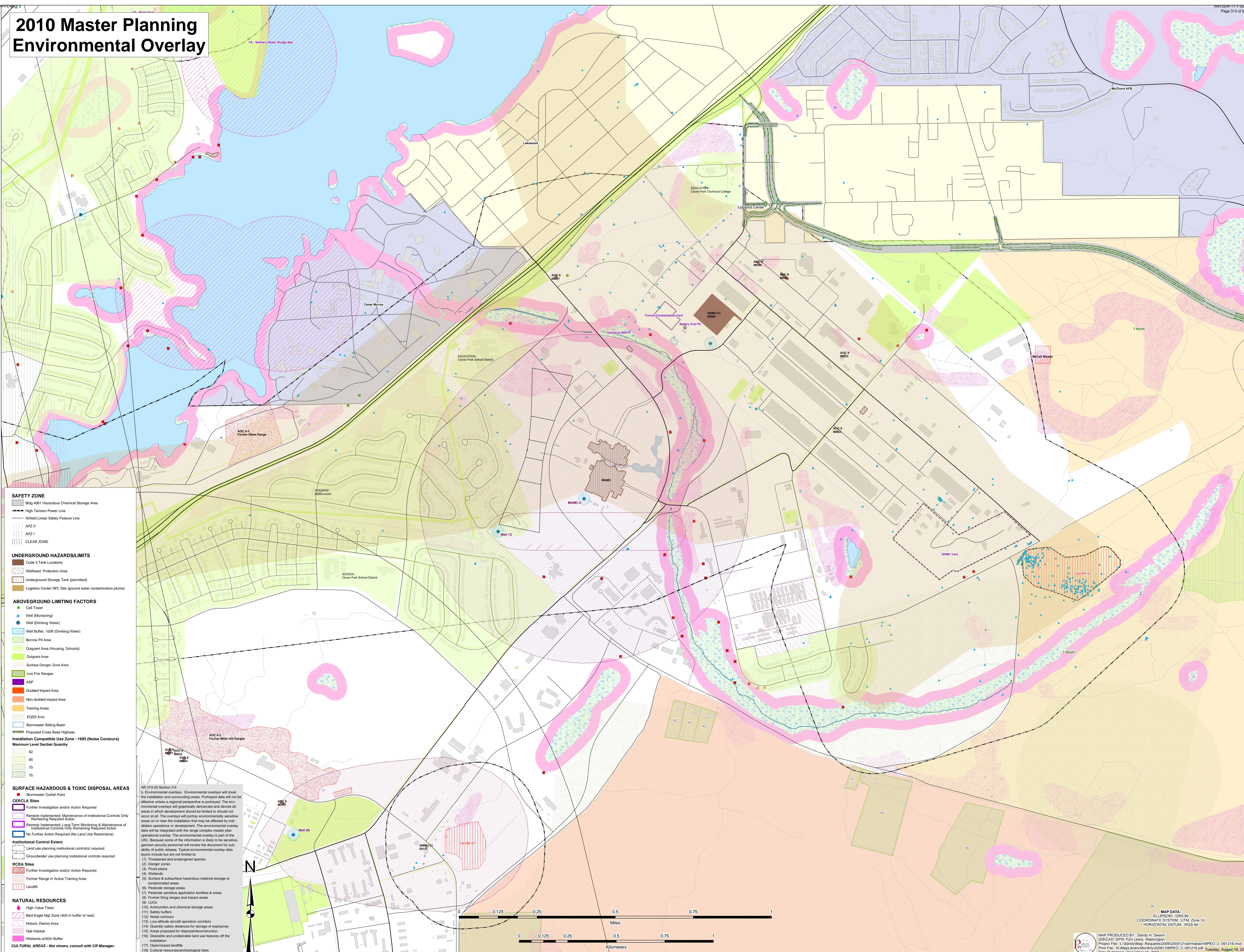
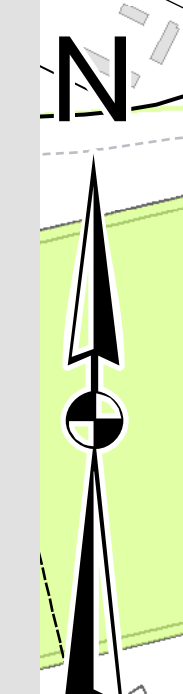
RCRA Sites

NATURAL RESOURCES

CULTURAL AREAS - Not shown, consult with CR Manager.

AR 210-20 Section 3-5
b. Environmental overlays. Environmental overlays will cover the installation and surrounding areas. Portrayed data will not be effective unless a regional perspective is portrayed. The environmental overlays will graphically demarcate and denote all areas in which development should be limited or should not occur at all. The overlays will portray environmentally sensitive areas on or near the installation that may be affected by installation operations or development. The environmental overlay data will be integrated with the range complex master plan operational overlay. The environmental overlay is part of the LIRC. Because some of the information is likely to be sensitive, persons security personnel will review the document for suitability of public release. Typical environmental overlay data layers include but are not limited to:

- (1) Threatened and endangered species
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- (6) Pesticide storage areas
- (7) Pesticide sensitive application facilities & areas
- (8) Former firing ranges and impact areas
- (9) LUCs
- (10) Ammunition and chemical storage areas
- (11) Safety buffers
- (12) Noise contours
- (13) Low altitude aircraft operation corridors
- (14) Quantity safety distances for storage of explosives
- (15) Areas proposed for disposal/reconstruction
- (16) Desirable and undesirable land use features off the installation
- (17) Overclosed landfills
- (18) Cultural resources/archeological sites



APPENDIX F – Conceptual Aesthetic Considerations

APPENDIX F

BUILDING PHOTOS APPENDIX

- E-1 **PURPOSE:** Photographic examples of buildings are provided in this appendix to illustrate the range of architectural styles and exterior materials currently existing on Joint Base Lewis-McChord Logistics Center.
- E-2 **CONTEXT:** Where the facility to be constructed is an infill project, the exterior shall be consistent with adjacent structures to maintain a cohesive local campus with additional architectural detailing added to clearly reflect the military hierarchy of the facility in the troop complex. All buildings shall remain compatible with installation design themes and military identity.
- E-3 **DESIGN FREEDOM:** Photographs presented in this Appendix are intended to show the as-built neighborhood context of the Logistics Center neighborhood. These photographs are not intended to restrict the creative approach of the contractor's proposals, nor are they intended to constrain the selection of materials and systems beyond the requirements stipulated in this RFP.
- E-4 **Exterior Finishes for Logistics Center Industrial Facilities:** Refer to Chapter 6, Paragraph 6.5.2.3.2 ARCHITECTURAL STYLE

Exterior Colors:

- Brick Veneer Façade: Size: 7-5/8"x 2-1/4"x 3"; Mutual Materials; Forest Blend Wire Cut Mission Finish Accent Band: Concrete Masonry Unit- Ground Face; Size: 4"x8"x16"; Mutual Materials; Mountain Brown
- Mortar: Standard Gray
- Metal-1: Metal Siding and Trim; AEP-Span; Color-Cool Parchment; Model: HR-36
- Metal-2: Window Frames, Flashing, Doors; Color-Match Metal-3
- Metal-3: Metal Roof; AEP-Span; Color-Cool Weathered Copper; Model: Standing Seam
- Metal-4: Metal Soffit Panel; AEP-Span; Color-Match Metal-1: Perforated metal soffit panel
- Metal-5: Metal Fascia, Gutter, Soffit, Flashing & Trim Assoc w/portico pediment & roof assemblies; Color-Match Metal-3;
- Metal-6: Downspouts-All Locations; Color-Match Metal-2 Precast Concrete Units: Olympian Precast; Washington Crème; Style-Acid Etched
- Sealant: Sealant at CMU Joints; Match to Brick Veneer

Image 1 – Architectural rendering of adjacent TEMF facility
(Illustrates varied height masonry base, upper and lower wall texture / appearance required)



Image 2 – Architectural rendering of adjacent TEMF facility
(Illustrates entry element appearance and massing)



Image 3 – Architectural rendering of adjacent TEMF facility
(Illustrates use of translucent panels for overhead doors, transom and clerestory elements)



Image 4 – Architectural rendering of adjacent TEMF facility
(Illustrates stepped-roof clerestory elements for daylighting)



Image 5 – Lawnmower Storage Building / Dumpster Enclosure
(Illustrates same style and materials use as building served)



Image 6 – Jackson Avenue Barracks – near Evergreen and Tahoma Streets
(Illustrates exterior sunshades control sun penetration)

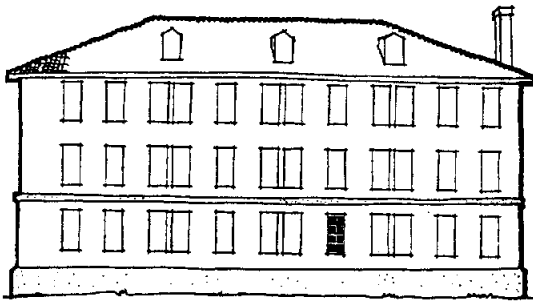


Image 7 – Jackson Avenue Barracks – near Evergreen and Tahoma Streets
(Illustrates tree preservation)

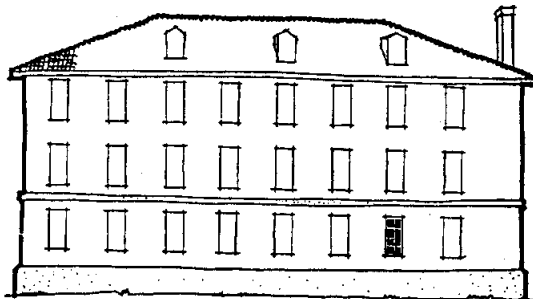


Image 8 – Syncopated Rhythm of Building Elements

(Illustrates the required syncopated rhythm of fenestration that helps break up the apparent mass of a building, compared with a regular pattern which can be monotonous)



This - syncopated rhythm of fenestration



Not this – regularly spaced pattern of fenestration

Image 9 – Golden Section

(Illustrates use of the Golden Section ($a/b=1.618$) in determining proportion and massing of Fort Lewis facilities)

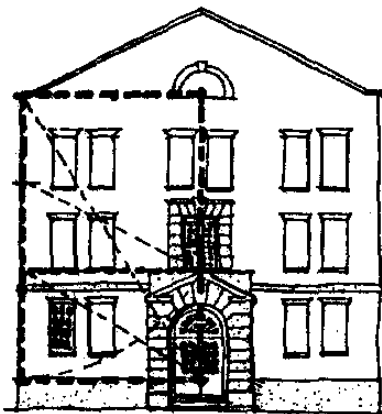
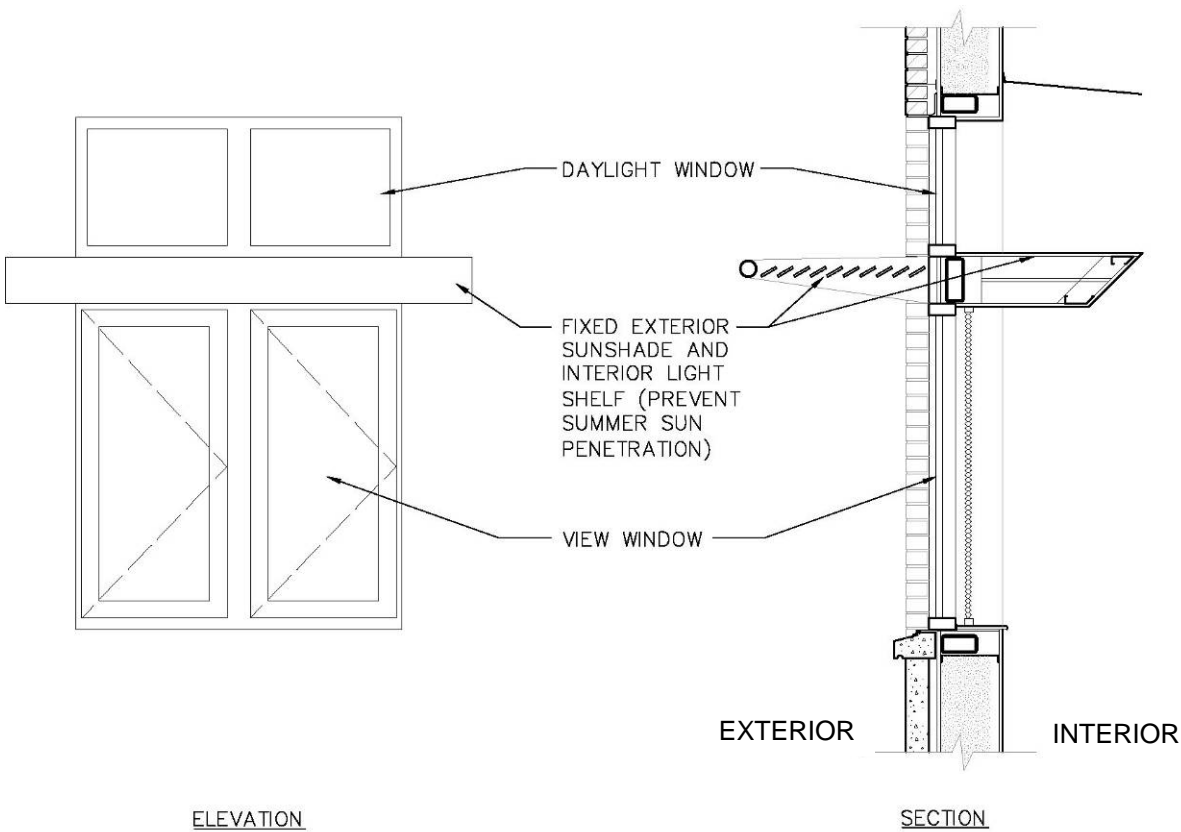


Image 10 – Split Window
(Illustrates daylighting and view window split with permanent interior and exterior architectural elements that prevent summer sun penetration to interior spaces, while allowing daylight and views)



APPENDIX G – GIS Data

Not Used

APPENDIX H – Exterior Signage

11751

APPENDIX I – Acceptable Plant List

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower		Interest		Light		Resistant		Soil Moisture		Function															
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen			
Botanical Name	Common Name	Characteristics										Culture						Use													
DECIDUOUS TREES																															
Acer Circinatum	Vine Maple	♦			♦						♦		♦		♦	♦		♦					♦								
Acer Ginnala	Amur Maple	♦			♦						♦				♦	♦		♦												♦	
Acer Griseum	Paperbark Maple	♦			♦					♦			♦			♦		♦												♦	
Acer Palmatum	Japanese Maple	♦			♦						♦		♦			♦		♦												♦	
Acer Rubrum	“Scarlet Sentinel” Red Maple	♦				♦					♦		♦			♦		♦		♦											
Acer Rubrum	“Autumn Blaze” Red Maple	♦				♦					♦		♦			♦		♦		♦											
Acer Rebrum	“Red Sunset” Red Maple	♦				♦					♦		♦			♦		♦		♦											
Acer Saccharum	“Bonfire” Sugar Maple	♦			♦						♦			♦		♦						♦									
Acer Saccharum	“Green Mountain” Sugar Maple	♦			♦				♦			♦		♦		♦						♦									
Amelanchier Laevis	Serviceberry	♦			♦				♦		♦		♦					♦						♦							
Betula Jacquemontii	Jacquemont Birch	♦				♦				♦				♦			♦							♦							
Carpinus Betulus “Fastigiata”	Columnar Hornbeam	♦		♦							♦		♦				♦				♦			♦	♦						
Cercidiphyllum Japonicum	Katsura Tree	♦		♦							♦		♦			♦	♦				♦										
Cercis Occidentalis	Western Rosebud	♦			♦				♦	♦	♦		♦		♦	♦		♦		♦				♦						♦	
Cornus Kousa	Kousa Dogwood	♦		♦					♦	♦	♦		♦			♦	♦						♦	♦						♦	
Continus Coggygria “Purpureus”	Smoke Tree	♦		♦					♦		♦			♦	♦	♦		♦													
Fraxinus Oxycarpa	Raywood Ash	♦				♦			♦			♦		♦		♦		♦		♦	♦		♦	♦							
Fraxinus Pennsylvanica	Cimmaron Ash	♦				♦			♦			♦		♦		♦		♦		♦	♦		♦	♦							
Fraxinus Pennsylvanica “Marshall’s Seedless”	Seedless Green Ash	♦				♦			♦			♦		♦		♦		♦		♦	♦		♦	♦							
Fraxinus Pennsylvanica	Patmore Ash	♦				♦			♦			♦		♦		♦		♦		♦	♦		♦	♦							
Ginkgo Bilboa “Autumn Gold”	Maidenhair Tree	♦		♦					♦			♦		♦		♦		♦		♦		♦								♦	
Gleditsia Triacanthos	“Shademaster” Honey Locust	♦			♦						♦			♦		♦		♦				♦								♦	
Gleditsia Triacanthos	“Skyline” Honey Locust	♦			♦						♦			♦		♦		♦				♦								♦	

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower		Interest		Light		Resistant		Soil Moisture		Function												
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name	Characteristics												Culture			Use											
DECIDUOUS TREES - CONTINUED																												
Larix Occidentalis	Western Larch	♦				♦						♦				♦							♦	♦				♦
Liquidambar Styracflua	American Sweetgum	♦			♦						♦	♦			♦			♦										
Liriodendrum Tulipfera	Tulip Tree	♦				♦		♦		♦	♦	♦			♦			♦				♦						
Magnolia Soulangeana	Saucer Magnolia	♦			♦				♦	♦				♦				♦				♦						♦
Magnolia Stellata	Star Magnolia	♦		♦					♦	♦				♦				♦										♦
Malus “Centurion”	Centurion Crabapple	♦			♦				♦	♦				♦				♦										♦
Malus “Prairiefire”	Prairiefire Crabapple	♦			♦				♦	♦				♦				♦										♦
Malus “Sugartyme”	Sugartyme Crabapple	♦			♦				♦	♦				♦				♦										♦
Parrotia Persica	Persian Parrotia	♦		♦					♦	♦	♦	♦		♦			♦		♦									♦
Pyrus Calleryana	“Chanticleer” Flowering Pear	♦			♦				♦	♦		♦		♦				♦										♦
Styrax Obassia	Fragrant Snowbell	♦		♦				♦		♦		♦		♦			♦	♦										♦
Tilia Tomentosua	Silver Linden	♦			♦			♦		♦		♦		♦	♦			♦				♦						
Tilia Cordata	Greenspire Linden	♦			♦			♦		♦		♦		♦	♦			♦				♦						
Zelkova Serrata	“Village Green” Sawleaf Zelkova	♦					♦					♦			♦	♦		♦			♦	♦						

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower			Interest			Light			Resis- tant		Soil Moisture			Function								
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name	Characteristics										Culture						Use										
EVERGREEN TREES																												
Calocedrus Decurrens	Incense Cedar		♦		♦						♦		♦		♦	♦		♦					♦					
Cedrus Atlantica	Atlas Cedar		♦	♦							♦			♦	♦			♦					♦					
Cedrus Deodara	Deodar Cedar		♦	♦							♦			♦	♦			♦					♦					
Chamaecyparis Nootkatensis	Alaska Yellow Cedar		♦	♦							♦		♦				♦						♦					♦
Chamaecyparis Obtusa	Hinoki False Cypress		♦	♦							♦		♦				♦						♦	♦				♦
Cupressocyparis Leylandii	Leyland Cypress		♦			♦					♦			♦	♦			♦					♦	♦	♦	♦		
Cupressus Sempervirens	“Indica” Italian Cypress		♦		♦						♦			♦	♦					♦			♦	♦		♦		
Juniperus Chinensis	“Robustsa Green” Juniper		♦		♦						♦			♦	♦					♦			♦	♦				
Juniperus Scopulorum “Blue Heaven”	Rocky Mountain Juniper		♦		♦						♦			♦	♦				♦				♦	♦				
Magnolia Grandiflora	“St. Mary” Southern Magnolia		♦	♦					♦	♦		♦					♦				♦		♦					♦
Pinus Contorta	Shore Pine		♦			♦					♦	♦			♦	♦				♦			♦	♦				
Pinus Flexilis	“Vanderwolf’s Pyramid” Limber Pine		♦	♦							♦	♦			♦	♦				♦				♦	♦			
Pinus Nigra	Austrian Pine		♦	♦		♦					♦	♦			♦	♦				♦			♦	♦				
Pinus Ponderosa	Ponderosa Pine		♦			♦					♦	♦			♦	♦				♦			♦	♦				
Pinus Sylvestris	Scotch Pine		♦			♦					♦	♦			♦	♦				♦			♦	♦				
Pseudotsuga Menziesii	Douglas Fir		♦			♦						♦		♦		♦			♦				♦	♦				
Thuja Occidentalis	“Emerald Green” Arborvitae		♦		♦						♦			♦	♦			♦					♦		♦	♦		
Thuja Plicata	Hogan Cedar		♦			♦					♦			♦	♦				♦				♦	♦	♦	♦		
Thuja Plicata	Western Red Cedar		♦			♦					♦	♦		♦				♦					♦	♦				
Tsuga Canadensis	Canada Hemlock		♦		♦							♦		♦				♦					♦	♦				
Tsuga Heterophylla	Western Hemlock		♦		♦							♦		♦					♦				♦	♦				
Tsuga Mertensiana	Mountain Hemlock		♦	♦								♦		♦														
Abie’s Grandis	Grand Fir		♦		♦						♦		♦						♦				♦	♦	♦			

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower		Interest		Light		Resistant		Soil Moisture		Function												
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
Botanical Name	Common Name	Characteristics								Culture								Use										
EVERGREEN SHRUBS																												
Arbutus Unedo	Strawberry Tree		♦	♦			♦			♦	♦	♦		♦		♦	♦		♦				♦	♦				
Arbutus Unedo “Compatica”	Compact Strawberry Tree		♦	♦						♦	♦	♦		♦		♦	♦		♦				♦	♦				
Buxus Sempervirens	English Boxwood		♦		♦							♦		♦				♦					♦	♦		♦		
Ceanothus Thyrseflorus	“Victoria” Ceanothus		♦			♦			♦	♦		♦			♦	♦				♦			♦	♦			♦	
Chamaecyparis Obtusa “Nana”	Dwarf Hinoki False Cypress		♦	♦								♦		♦				♦					♦	♦				
Cistus X Hybridus	White Rockrose		♦			♦			♦	♦		♦			♦	♦				♦				♦			♦	
Cistus X Purpureus	Purple Rockrose		♦			♦			♦	♦		♦			♦	♦				♦				♦			♦	
Cotoneaster Parneyi	Parney Cotoneaster		♦			♦	♦					♦			♦	♦	♦			♦			♦	♦			♦	
Daphne Cneorum	“Rugbyglow” Garland Daphne		♦		♦				♦	♦		♦		♦					♦				♦					
Elaeagnus Pungens	Pungent Elaeagnus		♦			♦	♦					♦		♦		♦			♦				♦	♦			♦	
Ilex Crenata	“Green Island” Japanese Holly		♦		♦							♦		♦					♦				♦		♦			
Ilex Crenata	“Northern Beauty” Japanese Holly		♦		♦							♦		♦					♦				♦		♦			
Lavandula Stoechas	Spanish Lavendar		♦		♦			♦		♦		♦		♦	♦	♦			♦				♦			♦		
Lonicera Pileata	Privet Honeysuckle		♦			♦			♦	♦		♦			♦				♦								♦	
Mahonia Aquifolium	Oregon Grape		♦			♦			♦	♦		♦		♦		♦	♦		♦				♦	♦		♦	♦	
Myrica Californica	Pacific Wax Myrtle		♦			♦						♦		♦		♦			♦					♦			♦	
Nandina Domestica	“Gulf Stream” Nandina		♦	♦				♦				♦		♦			♦		♦					♦			♦	
Osmanthus Delavayi	Delavay Osmanthus		♦		♦				♦	♦		♦			♦	♦			♦					♦				♦
Paxistima Myrsinites	Oregon Boxwood		♦		♦							♦			♦	♦			♦					♦				
Picea Abies “Nidiformis”	Bird’s Nest Spruce		♦	♦								♦		♦					♦					♦				
Pieris Japonica	Mountain Fire Andromeda		♦		♦				♦	♦		♦		♦				♦						♦				♦
Pinus Mugo “Pumilio”	Dwarf Mugo Pine		♦	♦								♦		♦		♦			♦					♦				
Pittosporum Tobira	Wheeler’s Dwarf Pittosporum		♦	♦				♦		♦		♦		♦					♦					♦				
Polystichum Munitum	Sword Fern		♦		♦							♦		♦					♦					♦				

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower			Interest			Light			Resis tant		Soil Moisture			Function									
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen	
Botanical Name	Common Name	Characteristics										Culture						Use											
EVERGREEN SHRUBS - CONTINUED																													
Prunus Lauracerasus	“Otto Luyken” Laurel		♦			♦			♦	♦		♦		♦		♦			♦					♦	♦		♦		
Prunus Laurocerasus	“Zabel” Laurel		♦			♦			♦	♦		♦		♦		♦			♦					♦	♦			♦	
Rhododendron	Anah Kruschkle Rhododendron		♦	♦				♦		♦		♦			♦			♦					♦	♦				♦	
Rhododendron	Gomer Waterer Rhododendron		♦	♦				♦		♦		♦			♦			♦										♦	
Rhododendron	Loder’s White Rhododendron		♦	♦				♦		♦		♦			♦			♦										♦	
Rhododendron	“Lucy Lou” Dwarf Rhododendron		♦	♦					♦	♦		♦			♦			♦							♦				
Rhododendron	“Myrtifolium” Dwarf Rhododendron		♦	♦				♦		♦		♦			♦			♦							♦				
Rhododendron	“PJM” Rhododendron		♦	♦					♦	♦		♦			♦			♦							♦				
Rhododendron	“Purple Splendor” Rhododendron		♦	♦				♦		♦		♦	♦		♦			♦						♦	♦			♦	
Rhododendron	Dwarf Rhododendron		♦	♦					♦	♦		♦	♦		♦			♦							♦				
Rhododendron	Rosamundi Rhododendron		♦	♦					♦	♦		♦		♦				♦							♦			♦	
Rhododendron	Unique Rhododendron		♦	♦					♦	♦		♦		♦				♦						♦	♦				
Rhododendron	Yakusimanum		♦	♦				♦		♦		♦		♦				♦							♦				
Rosmarinus Officinalis	Rosemary		♦			♦			♦	♦		♦			♦	♦	♦			♦					♦			♦	
Sarcococca Ruscifolia	Fragrant Sarcococca		♦		♦				♦	♦		♦	♦						♦						♦				
Senecio Greyi	Senecio		♦			♦			♦		♦			♦	♦			♦							♦				
Taxus Baccata “Repandens”	Spreading English Yew		♦	♦									♦		♦		♦			♦					♦			♦	
Vaccinium Ovatum	Evergreen Huckleberry		♦	♦								♦		♦		♦			♦						♦				
Viburnum Davidii	Dauids Virburnum		♦		♦				♦	♦		♦		♦		♦			♦						♦			♦	
Viburnum Tinus	“Spring Bouquet” Laurustinus		♦		♦		♦		♦	♦		♦		♦		♦			♦						♦	♦		♦	

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower		Interest		Light		Resistant		Soil Moisture		Function												
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen
		Characteristics										Culture					Use											
Botanical Name	Common Name	Characteristics										Culture					Use											
DECIDUOUS SCHRUBS																												
Amelanchier Alnifolia	Western Serviceberry				♦				♦	♦		♦		♦				♦						♦				
Azalea Exgeny	Exbury Azalea	♦			♦				♦	♦	♦	♦		♦				♦						♦				♦
Azalea Mollis	Azalea Mollis	♦			♦				♦	♦	♦	♦						♦						♦				♦
Berberis Thunbergii	“Red Dwarf” Japanese Barberry	♦		♦								♦		♦	♦			♦						♦				
Berberis Thunbergii	“Crimson Pygmy” Japanese Barberry	♦		♦								♦		♦	♦			♦						♦				
Berberis Thunbergii	“Rose Glow” Japanese Barberry	♦										♦		♦	♦			♦						♦				
Caryopteris X Clandonensis	Bluebeard	♦			♦		♦	♦				♦		♦	♦			♦						♦				
Cornus Stolonifera	Redtwig Dogwood	♦				♦			♦					♦		♦			♦			♦		♦				
Cornus Stolonifera	“Silver & Gold” Dogwood	♦				♦			♦	♦				♦		♦			♦					♦				
Cotoneaster Horizontalis	Rock Cotoneaster	♦			♦				♦		♦	♦		♦	♦	♦			♦					♦				
Enkianthus Campanulatus	Enkianthus	♦		♦					♦	♦	♦	♦	♦					♦						♦				♦
Euonymus Alata “Compacta”	Compact Burning Bush	♦				♦					♦	♦		♦	♦				♦					♦			♦	
Hamamelis X Intermedia	“Diane” Witchhazel	♦			♦				♦	♦		♦						♦						♦				♦
Holodiscus Discolor	Ocean Spray	♦				♦			♦		♦			♦		♦				♦				♦				
Hydrangea Macrophylla	“Lacecap” Hydrangea	♦				♦		♦		♦		♦	♦					♦					♦	♦				
Oemleria Cerasiformis	Indian Plum	♦			♦				♦	♦		♦						♦						♦				
Philadelphus Lewisii	Mock Orange	♦				♦		♦		♦				♦				♦					♦	♦				
Potentilla Fruticosa	Shrubby Cinquefoil	♦			♦				♦		♦			♦	♦				♦					♦			♦	
Rhus Glabra	Smooth Sumac	♦							♦		♦			♦	♦				♦					♦			♦	
Rhus Typhina “Laciniata”	Cutleaf Sumac	♦							♦		♦			♦	♦				♦					♦			♦	♦
Ribes Aureum	Golden Currant	♦				♦			♦	♦		♦		♦					♦					♦			♦	
Ribes Sanguineum	“Red Flowering” Currant	♦				♦			♦	♦		♦		♦		♦			♦					♦			♦	
Ribes Sanguineum	“Elk River Red” Currant	♦				♦			♦	♦		♦		♦		♦			♦					♦			♦	
Rosa Rugosa	Ramanas Rose	♦				♦		♦	♦	♦		♦		♦	♦	♦			♦					♦		♦	♦	
Rosa Woodsii	Wood’s Rose	♦				♦		♦		♦		♦		♦	♦				♦					♦				♦
Spirea Nipponica	“Snowmound” Spirea	♦			♦				♦			♦			♦				♦					♦				
Symphoricarpos Albus	Common Strawberry	♦			♦				♦	♦		♦		♦					♦					♦			♦	
Syringa Meyer “Palibin”	Dwarf Korean Lilac	♦			♦				♦	♦				♦	♦				♦					♦				♦
Viburnum Tomentosum “Mariesii”	Doublefile Viburnum	♦				♦			♦			♦			♦				♦					♦				♦

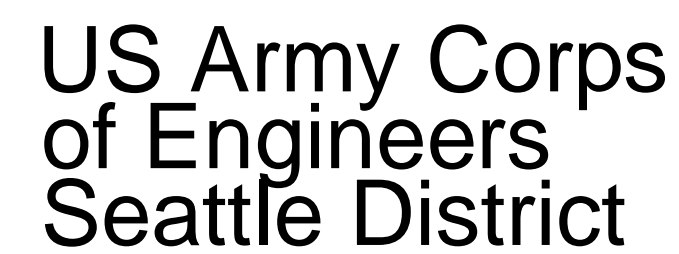
PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower		Interest		Light		Resistant		Soil Moisture		Function															
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen			
Botanical Name	Common Name	Characteristics										Culture										Use									
GROUND COVERS/VINES																															
Ajuga Reptans	Carpet Bugle	♦				♦		♦		♦		♦				♦															
Arctostaphylos Ursi “Vancouver Jade”	Kinnikinnick		♦	♦					♦	♦		♦				♦	♦			♦										♦	
Calluna Vulgaris	“Aurea” Heather		♦					♦		♦		♦				♦				♦						♦				♦	
Calluna Vulgaris	“Corbet Red” Heather		♦		♦			♦		♦		♦				♦				♦						♦				♦	
Calluna Vulgaris	“Robert Chapman” Heather		♦		♦			♦		♦		♦				♦				♦						♦				♦	
Clematis Armandii	Evergreen Clematis					♦			♦	♦		♦				♦				♦											
Clematis Montana “Rubens”	Deciduous Clematis	♦				♦			♦	♦		♦				♦				♦											
Cotoneaster Dammeri	Bearberry Cotoneaster		♦			♦			♦			♦				♦	♦					♦								♦	
Erica Carnea	“Mediterranean Pink” Heath		♦	♦					♦	♦		♦				♦				♦										♦	
Erica Carnea	“Springwood White” Heath		♦	♦					♦	♦		♦				♦				♦										♦	
Erica Carnea	“Winter Beauty” Heath		♦	♦					♦	♦		♦				♦				♦										♦	
Euonymus Fortunei “Colorata”	“Purple Leaf” Wintercreeper		♦			♦						♦		♦						♦											
Euonymus Fortunei	“Kewensis” Wintercreeper		♦			♦						♦		♦	♦					♦											
Fragaria Chiloensis	Sand Strawberry		♦			♦			♦	♦		♦				♦				♦										♦	
Gaultheria Shallon	Salal		♦		♦				♦			♦		♦		♦														♦	
Hydrangea Petiolaris	Climbing Hydrangea	♦				♦		♦		♦		♦						♦													
Hypericum Calycium	St. Johnswort		♦			♦		♦		♦		♦		♦	♦				♦											♦	
Juniperis Conferta “Blue Pacific”	Shore Juniper		♦		♦							♦		♦	♦					♦						♦				♦	
Juniperis Horizontalis	“Blue Chip” Juniper		♦		♦							♦		♦	♦					♦						♦				♦	
Juniperis Horizontalis	“Prince of Wales” Juniper		♦		♦							♦		♦	♦					♦						♦				♦	
Juniperis Horizontalis	“Wilton” Juniper		♦		♦							♦		♦	♦					♦						♦				♦	
Juniperis Procumbens	“Green Mound Garden” Juniper		♦		♦							♦		♦	♦					♦						♦				♦	
Juniperis Sabina	“Braodmoor” Juniper		♦		♦							♦		♦	♦					♦						♦				♦	

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth		Flower			Interest			Light		Resistant		Soil Moisture		Function											
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen	
Botanical Name	Common Name	Characteristics												Culture						Use									
GROUND COVERS/VINES - CONTINUED																													
Mahonia Nervosa	Longleaf Mahonia		♦		♦				♦	♦		♦		♦		♦			♦									♦	
Mahonia Repans	Creeping Mahonia		♦		♦				♦	♦		♦		♦		♦			♦									♦	
Pachysandra Terminalis	Japanese Spurge		♦	♦					♦			♦	♦				♦												
Rosmarinus Officinalis “Prostratus”	Creeping Rosemary		♦			♦			♦	♦		♦			♦	♦	♦			♦								♦	
Rubus Calycinoides “Emerald Carpet”	Creeping Raspberry		♦			♦			♦	♦		♦		♦					♦									♦	
Sarcococca Hookeriana “Humilis”	Low Sweetbox		♦		♦				♦			♦	♦						♦										
Thymus Pesudolanuginosus	Wooly Thyme		♦		♦			♦				♦			♦	♦			♦										
Thymus Serphyllum	Wild Thyme		♦		♦			♦				♦			♦	♦			♦										
Vinca Minor	Dwarf Periwinkle		♦			♦			♦	♦		♦		♦					♦									♦	

PLANT SELECTION LIST Plant Materials Suitability Section		Type		Growth			Flower			Interest			Light			Resi stant		Soil Moisture			Function										
		Deciduous	Evergreen	Slow	Medium	Fast	Fall	Summer	Spring	Flower	Bark	Foliage	Shade	Sun/Shade	Sun	Drought	Pest	Moist	Average	Dry	Street Tree	Shade Tree	Screen	Massing	Windbreak	Hedge	Bank Cover	Specimen			
Botanical Name	Common Name	Characteristics											Culture						Use												
GRASSES & PERENNIALS																															
Acorus Gramineus “Ogon”	Sweetflag		♦		♦						♦			♦			♦							♦							
Carex Morrowii “Aureo Variegata”	Variegated Sedge			♦							♦		♦				♦							♦							
Epimedium Grandiflorum “Rose Queen”	Bishop’s Hat							♦	♦		♦		♦		♦			♦													
Epimedium X Rubrum	Bishop’s Hat					♦		♦	♦		♦		♦		♦			♦													
Geranium SP.	Cranesbill					♦		♦		♦		♦		♦				♦													
Helictotrichon Sempervirens	Blue Oat Grass		♦			♦		♦	♦		♦			♦	♦																
Hemerocallis Sp.	Daylily					♦		♦		♦		♦		♦	♦																
Heuchera Micrantha	“Palace Purple” Coral Bells				♦			♦		♦		♦	♦						♦												
Hosta Sp.	Plantain Lily			♦				♦		♦		♦	♦					♦													
Liatris Spicata “Kobold”	Gayfeather					♦		♦		♦		♦			♦	♦			♦												
Liriope Muscari	Big Blue Lilyturf			♦							♦	♦							♦												
Lithodora Diffusa	“Grace Ward” Lithodora					♦		♦		♦		♦			♦	♦				♦									♦		
Miscanthis Sinensis	“Yaku Jima” Silver Grass					♦		♦		♦		♦		♦					♦										♦		
Miscanthis Sinensis “Zebrinus”	Zebra Grass					♦		♦		♦		♦		♦					♦										♦		
Ophiopogon Japonicus “Nana”	Dwarf Mondo Grass			♦				♦				♦	♦						♦												
Pennisetum Alopecuroides	Fountain Grass				♦			♦		♦		♦		♦					♦												
Sedum Spurium	“Dragon’s Blood” Stonecrop					♦		♦		♦		♦		♦		♦				♦											
Veronics Peduncularis	“Georgia Blue” Speedwell				♦				♦	♦		♦		♦					♦												

[Links](#)
[Go to Appendix P](#)
[Go to Table of Contents](#)

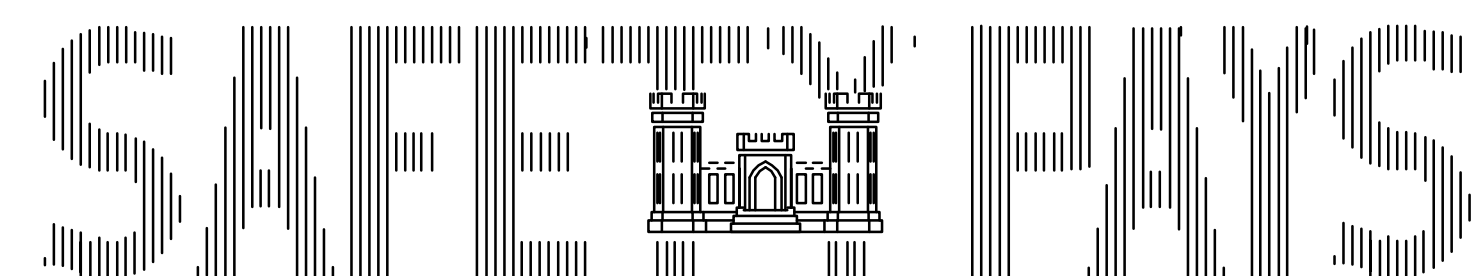
APPENDIX J – Drawings



REGIONAL LOGISTICS SUPPORT CENTER (RLSC) JOINT BASE LEWIS-McCHORD, WA



<u>SHT</u>	<u>PLATE</u>	<u>TITLE</u>
		<u>GENERAL</u>
1	G-001	TITLE SHEET AND INDEX OF DRAWINGS
		<u>CIVIL</u>
2	C-100	CONTRACTOR MOBILIZATION PLAN
3	C-101	DEMOLITION PLAN
4	C-102	SITE CONCEPT PLAN
5	C-103	GRADING CONCEPT PLAN
6	C-104	UTILITY CONCEPT PLAN
		<u>ELECTRICAL</u>
7	E-101	ELECTRICAL DEMOLITION PLAN
8	E-102	ELECTRICAL SITE PLAN
9	E-103	SITE DEVELOPMENT ONE-LINE
10	E-104	COMMUNICATIONS SITE PLAN



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SEATTLE DISTRICT

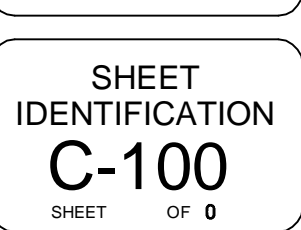
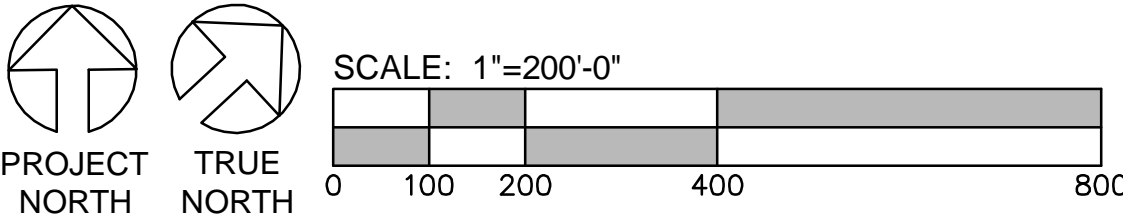
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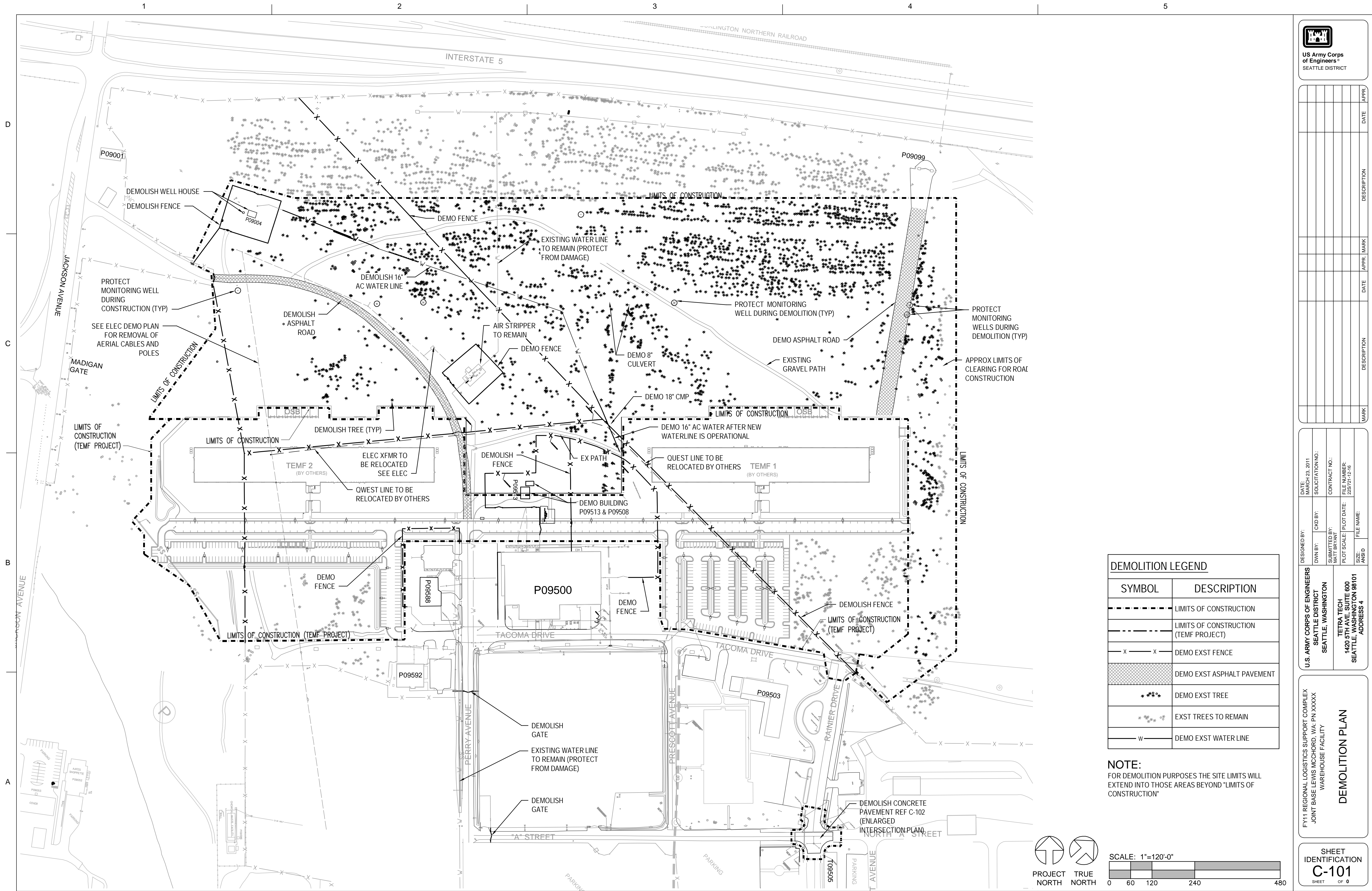
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	DWN BY:	CMD BY:
	SUBMITTED BY:	CONTRACT NO.:
	MAT BRYANT PLOT SCALE: PLOT DATE:	FILE NUMBER: 235721-12-16
SIZE:	FILE NAME:	
ANSI D		

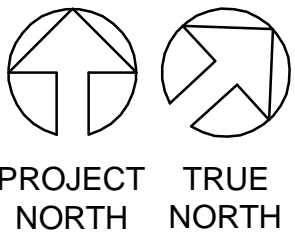
FY11 REGIONAL LOGISTICS SUPPORT COMPLEX
 JOINT BASE LEWIS MCCORD, WA: PN XXXXX
 WAREHOUSE FACILITY

TITLE SHEET AND INDEX OF DRAWINGS

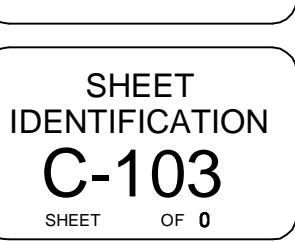
SHEET
IDENTIFICATION
G-001
SHEET 1 OF 0

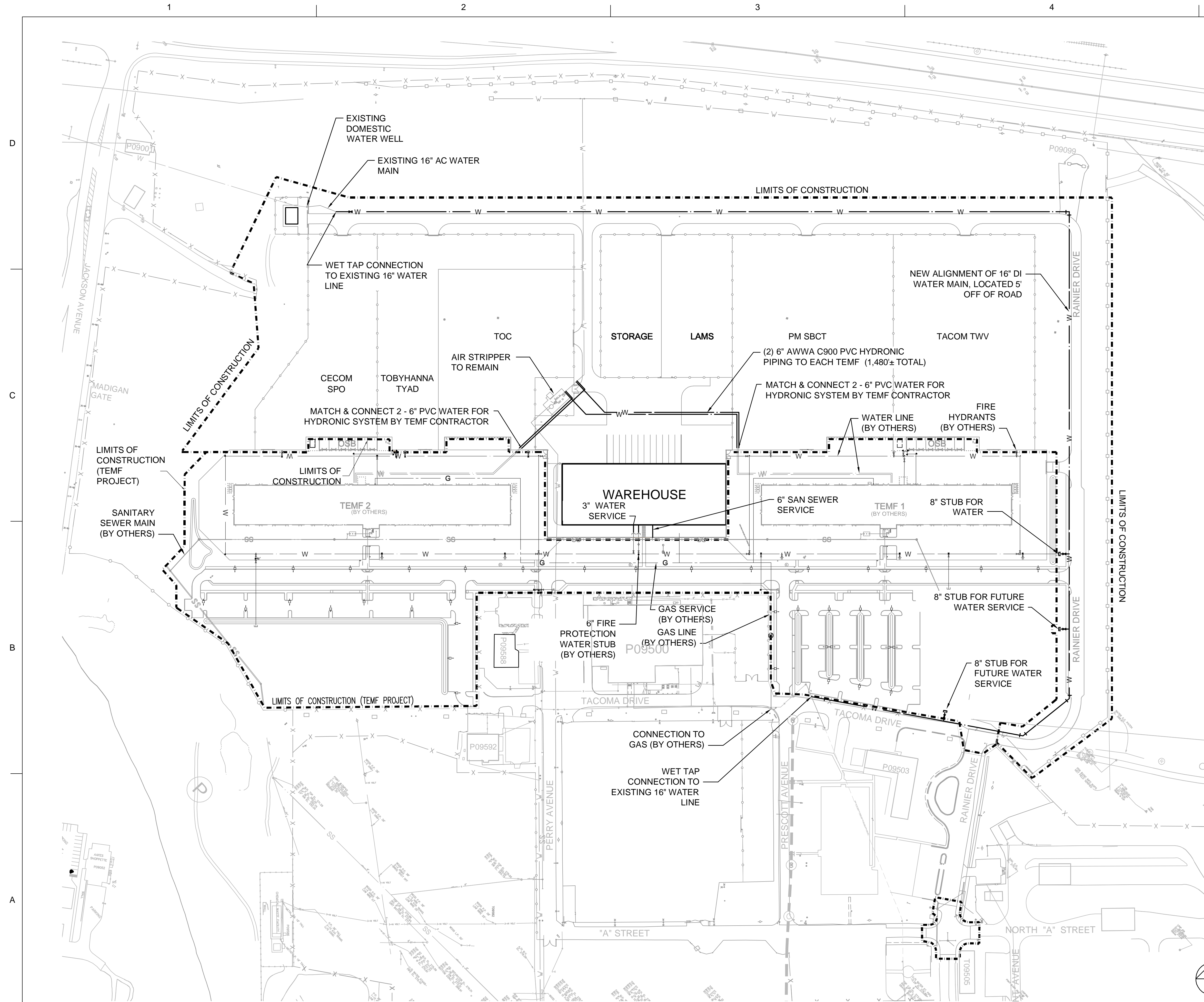






Age Group	Number of People
18-24	120
25-34	180
35-44	120
45-54	180
55-64	120
65-74	180
75-84	120
85+	180





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SEATTLE DISTRICT

[illegible]

U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT SEATTLE, WASHINGTON	DESIGNED BY:	DATE:
	DRAWN BY:	MARCH 23, 2011
	CHECKED BY:	SOLICITATION NO.:
	SUBMITTED BY:	CONTRACT NO.:
TETRA TECH 1420 4TH AVE, SUITE 600 SEATTLE, WASHINGTON 98101 ADDRESS 4	PILOT SCALE:	FILE NUMBER:
	DATE:	258721-12-16
	SIZE:	FILE NAME:
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Y11 REGIONAL LOGISTICS SUPPORT COMPLEX
JOINT BASE LEWIS MCCORD, WA: PN XXXXX
WAREHOUSE FACILITY

UTILITY CONCEPT PLAN

SHEET
IDENTIFICATION
C-104
SHEET OF 0

1. ONE-LINE IS DIAGRAMMATIC AND IS INTENDED TO SHOW THE MINIMUM QUANTITY, TYPE, AND LOCATION OF SWITCHES AND JUNCTIONS REQUIRED TO RELOCATE THE PRIMARY AERIAL FEEDER FROM THE MADIGAN SUBSTATION, PROVIDE SERVICE FOR THIS PROJECT AND MAINTAIN SERVICES FOR EXISTING FACILITIES. CONTRACTOR SHALL PROVIDE A COMPLETE 15KV DISTRIBUTION SYSTEM TO SUPPORT A 600A MAIN LINE AND 200A DISTRIBUTION LOOPS. ITEMS MARKED AS FUTURE ARE NOT PROVIDED IN THIS CONTRACT, BUT PROVISIONS MUST BE INCLUDED FOR THEIR FUTURE INSTALLATION. FOR ADDITIONAL INFORMATION REFER TO THE RFP.

3. ALL PRIMARY CONDUCTORS ROUTED TO AND FROM THE 200A SECTIONS OF THE SWITCHES TO JUNCTION MANHOLES AND BETWEEN JUNCTIONS SHALL BE #4/0, 15KV, EPR, CU WITH 133% INSULATION AND INSTALLED IN 4-INCH CONCRETE ENCASED DUCTS.

5. ALL PRIMARY DUCT BANKS SHALL CONSIST OF TWO DUCTS. ALL STUB-OUTS FOR FUTURE INSTALLATIONS SHALL CONSIST OF TWO DUCTS. ALL UNUSED DUCTS SHALL HAVE A PULLWIRE.

7. THE WAREHOUSE TRANSFORMER, THE STREET LIGHTING TRANSFORMER, THE RELOCATED TRANSFORMER FOR THE AIR TOWER, THE LAMS AND STORAGE TRANSFORMER, AND ALL SWITCHES SHALL BE PLACED ON VAULTS.



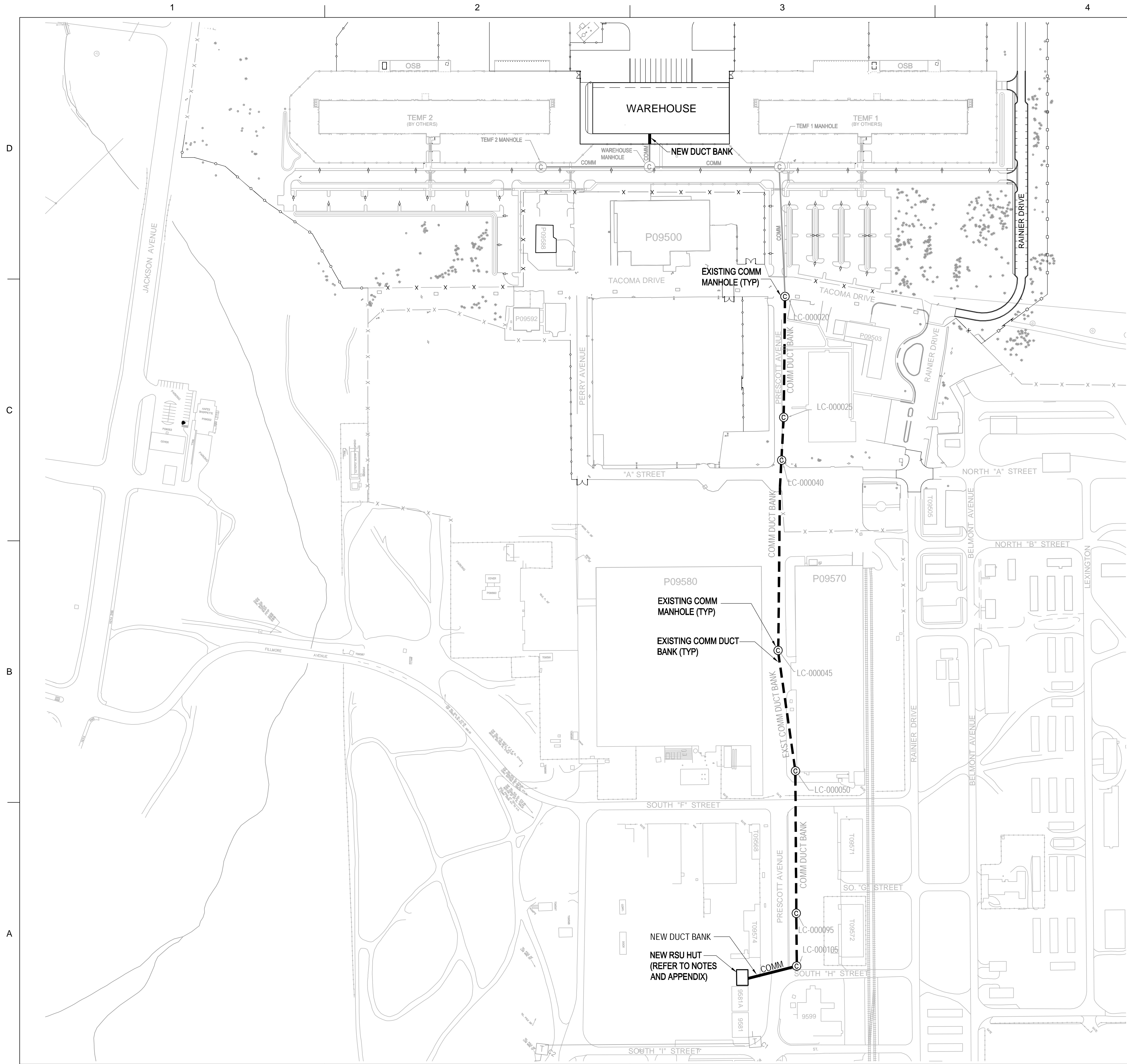
NOT TO SCALE

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TETRA TECH 1420 5TH AVE., SUITE 600 SEATTLE, WASHINGTON 98101 ADDRESS 4	SUBMITTED BY:		CONTRACT NO.:	
	WALT BRYANT PLOT SCALE:		PLOT DATE: 2/27/21-1/5/16	
	SIZE:	FILE NAME:		

WAREHOUSE FACILITY
JOINT BASE LEWIS MCCORD, WA; PN XXXXX
FY11 REGIONAL LOGISTICS SUPPORT COMPLEX

SHEET
IDENTIFICATION
E-103
SHEET X OF 0

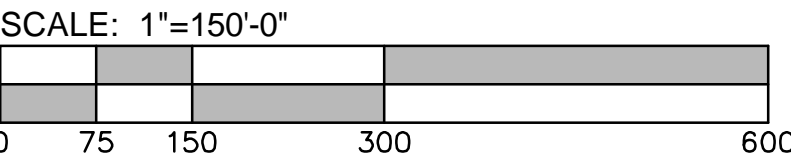
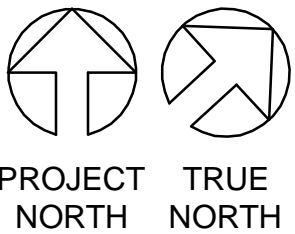


OSP SCOPE

- THE NEW OSP INFRASTRUCTURE SHALL EXTEND TO LC-20 FROM THE RSU. THE PATHWAY TO THE TEMFS AND WAREHOUSE SHALL BE EXTENDED BY THE WAREHOUSE CONTRACTOR.
- THE REMOTE SWITCH UNIT (RSU) SPECIFICATIONS SHALL PARALLEL THE JACKSON AVENUE UNIT
- ROOM 106 IN THE RSU SHALL REMAIN BUT WILL HAVE A FUTURE NAME CHANGE AND WILL NO LONGER BE CALLED AN "OPERATOR" ROOM
- THE COPPER FRAME IN THE RSU SHALL CONSIST OF:
 - A. NEWTON WALL MOUNTED UNIVERSAL DISTRIBUTING FRAME (SINGLE SIDED) - NEWTON PART NUMBER 005027
 - B. EMERSON R399 CONNECTORS WITH WIRE-WRAP EQUIPMENT FIELD SHALL BE USED TO TERMINATE THE COPPER BACKBONE IN THE RSU - EMERSON PART NUMBER R399AA
 - C. ALL OSP COPPER CABLE SHALL BE A MINIMUM OF 24 AWG.
 - D. PREFORMED/ARMADILLO (NITROGEN) STAINLESS SPLICE CASE WITH BONDING SHALL BE INSTALLED TO TRANSITION CABLING. NO OVERSIZED ENCLOSURES SHALL BE ACCEPTED. FOR A 1200 PAIR CABLE AN 8" X 28" CASE WILL BE SPECIFIED, PREFORMED PART NUMBER 8006320.
- THE FIBER FRAME IN THE RSU SHALL CONSIST OF:
 - A. CPI CHATSWORTH UNIVERSAL RACKS SHALL BE UTILIZED FOR THE FRAME
 - B. CORNING CLOSET CONNECTOR HOUSING (CCH) SHALL BE UTILIZED TO SUPPORT THE FIBER TERMINATIONS
 - C. ALL STRANDS SHALL BE TERMINATED WITH "ST"-TYPE CONNECTORS AND BE MOUNTED IN CORNING 12 FIBER CCH-CPs
 - D. ALL FIBER SPLICE CASES SHALL BE MANUFACTURED BY TYCO.
- ALL OSP TELECOM CABLING SLACK SHALL BE KEPT IN THE MAINTENANCE HOLE AND NOT THE RSU
- ALL TELECOM LADDER RACK ON THE PROJECT SHALL BE CPI CHATSWORTH, UNIVERSAL CABLE RUNWAY TYPE (PART NUMBER:10250-712 OR 10250-724)
- FIBER OPTIC CABLES TO BE INSTALLED IN MAXCELL INNERDUCT PER THE MANUFACTURER'S STANDARDS. A TOTAL OF 9 INNERDUCTS ARE REQUIRED WITH PULL STRINGS IN EACH DUCT.

LEGEND	
SYMBOL	DESCRIPTION
	EXISTING COMM DUCT BANK
	COMM NEW 6X12 DUCT BANK
	EXISTING COMM MANHOLE
	COMM MANHOLE BY TEMF CONTRACTOR
	COMM DUCTBANK AND CABLING BY TEMF CONTRACTOR

COMM REQUIREMENTS		
CATEGORY	COPPER	FIBER
WAREHOUSE	100	12
TEMF #1	250	24
TEMF #2	250	24



DATE	SOLICITATION NO.	CONTRACT NO.	FILE NUMBER	DATE	DESCRIPTION	MARK
MARCH 23, 2011			228721-12-16			

DESIGNED BY:	CHKD BY:	DATE:
DWN BY:	SUBMITTED BY:	MARCH 23, 2011
MATT BRYANT	MATT BRYANT	
FILE NAME:	FILE NUMBER:	
ANSID	228721-12-16	

U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT SEATTLE, WASHINGTON	TETRA TECH 1420 5TH AVE, SUITE 600 SEATTLE, WASHINGTON 98101 ADDRESS 4
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FY11 REGIONAL LOGISTICS SUPPORT COMPLEX
JOINT BASE LEWIS MCCORD, WA: PN XXXX
WAREHOUSE FACILITY

COMMUNICATIONS SITE PLAN

SHEET IDENTIFICATION
E-104
SHEET OF 0

APPENDIX K – Utility Rates

FT Lewis FY 10 Utility Rates

Installation: Fort Lewis, WA

Date: 15 Apr 2010

Sales Rate Summary

	Rates for FY10				Rates for FY09		
	A	H	B	AAFES	A	H	B
Electric(\$/kWh)	\$0.04473	\$0.04218	\$0.05983	\$0.03865	\$0.04473	\$0.0422	\$0.0598
Nat Gas(\$/therm)							
Firm	\$0.9555	N/A	\$0.9842	\$0.9555	\$1.2387	N/A	\$1.2759
Interruptible	\$0.6712	N/A	\$0.6913	\$0.6712	\$0.9096	N/A	\$0.9369
Water(\$/KGal)	\$1.29627	\$1.07261	\$1.70617	\$0.85884	\$1.2963	\$1.0726	\$1.7062
Sewage(\$/KGal)	\$2.2707	\$1.00271	\$3.0102	NA	\$2.2707	\$1.0027	\$3.0102
Refuse(\$/Ton)	\$160.9334	N/A	\$165.7614	\$160.93341	\$160.9334	N/A	\$165.7614
Refuse(\$/Pickup-8 Yd container)	\$114.9065	N/A	\$118.3536	\$114.90645	\$114.9065	N/A	\$118.3536
LP Gas(\$/Gal)	\$0.0000	N/A	\$0.0000	NA	\$0.0000	N/A	\$0.0000
#2 Fuel Oil(\$/Gal)	\$2.1400	N/A	\$2.2042	NA	\$2.1400	N/A	\$2.2042
Steam(\$/KLb)	\$13.6080	N/A	\$16.3803	NA	\$16.3810	N/A	\$19.2365
Space Htg(\$/SqFt/Mo)	\$0.1534	NA	\$0.1907	NA	\$0.2025	NA	\$0.2413

Prepared by: ESD, PW, Fort Lewis



Telephone (253) 966-1741

Rate A: Federal Customers
 Rate H: Family Housing
 Rate B: Non-Federal Customers
 Revision date: 15 Apr 2010

Notes:

H Rate Excludes Recapitalization Costs to Common Infrastructure & Cost of Capital
 AAFES Rate Excludes Recapitalization Costs to Common Infrastructure & Cost of Capital

APPENDIX L**LEED Project Credit Guidance (MAY 10)**

This spreadsheet indicates Army required credits, Army preferred credits, project-specific ranking of individual point preferences, assumptions guidance for individual credits, and references to related language in the RFP for individual credits.

	LEED Credit Paragraph		Army Guidance: Required - Preferred - Avoid	Project Preference Ranking: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)	
		LEED Project Credit Guidance			
PAR		FEATURE			REMARKS
<u>SUSTAINABLE SITES</u>					
SSPR1		Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
SS1		Site Selection		X	See paragraph LEED CREDITS COORDINATION.

SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	See paragraph LEED CREDITS COORDINATION.
	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		X	See paragraph LEED CREDITS COORDINATION.
SS3	Brownfield Redevelopment		X	See paragraph LEED CREDITS COORDINATION.
SS4.1	Alternative Transportation: Public Transportation Access		X	See paragraph LEED CREDITS COORDINATION.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref		Assume that non-transient building occupants are NOT housed on Post unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1			Requires provision of vehicles, which cannot be purchased with construction funds. Assume Government will not provide vehicles unless indicated otherwise. Assume that 50% of GOV fleet is NOT alternative fuel vehicles unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	Pref		
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3			Requires provision of vehicle refueling stations. Installation must support type of fuel and commit to maintaining/supporting refueling stations.
SS4.4	Alternative Transportation: Parking Capacity	Pref		

SS5.1	Site Development: Protect or Restore Habitat			
SS5.2	Site Development: Maximize Open Space	Pref		Assume AGMBC option for aggregated open space at another location on the installation is not available to the project unless indicated otherwise.
SS6.1	Stormwater Design: Quantity Control	Pref		See paragraph STORMWATER MANAGEMENT.
SS6.2	Stormwater Design: Quality Control	Pref		See paragraph STORMWATER MANAGEMENT.
SS7.1	Heat Island Effect: Non-Roof			
SS7.2	Heat Island Effect: Roof	Pref		Coordinate with nearby airfield requirements, which may preclude this credit.
SS8	Light Pollution Reduction	Pref		
<u>WATER EFFICIENCY</u>				
WEPR1	Water Use Reduction (Version 3 only)	Rqd	Rqd	All LEED prerequisites are required to be met.
WE1.1	Water Efficient Landscaping: Reduce by 50%	Pref		See paragraph IRRIGATION. Project must include landscaping to be eligible for this credit.
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	Pref		Project must include landscaping to be eligible for this credit.
WE2	Innovative Wastewater Technologies - OPTION 1			
WE2	Innovative Wastewater Technologies - OPTION 2			
WE3	Water Use Reduction	Pref		See paragraph BUILDING WATER USE REDUCTION.

ENERGY AND ATMOSPHERE				
EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR2	Minimum Energy Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EA1	Optimize Energy Performance	Rqd	1	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION , as a minimum, is required.
EA2.1	On-Site Renewable Energy	Pref		See paragraph ENERGY CONSERVATION .
EA3	Enhanced Commissioning	Rqd		See paragraph COMMISSIONING . The Commissioning Authority may be provided through the Design-Build Contractor only if in accordance with USGBC Credit Interpretation Ruling (CIR) dated 9/15/06. Commissioning Authority activities begin during design phase and continue well beyond beneficial occupancy. Assume Government will not provide CxA post-occupancy activities unless indicated otherwise.
EA4	Enhanced Refrigerant Management			
EA5	Measurement & Verification			Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		X	See paragraph LEED CREDITS COORDINATION .

MATERIALS AND RESOURCES				
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Coordinate with Installation during design development on collection service and receptacles.
MR1	Building Reuse			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref		See paragraph CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref		
MR3	Materials Reuse			
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Pref		See paragraph RECYCLED CONTENT.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Pref		
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally			
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally			

MR6	Rapidly Renewable Materials	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS and paragraph FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM.
MR7	Certified Wood	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS.
INDOOR ENVIRONMENTAL QUALITY				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Assume all buildings are smoke free unless indicated otherwise (family housing, barracks and other lodging are facility types where smoking may be permitted in some cases).
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			
EQ3.1	Construction IAQ Management Plan: During Construction	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.2	Low Emitting Materials: Paints & Coatings	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.3	Low Emitting Materials: Carpet/Flooring Systems	Pref		See paragraph LOW-EMITTING MATERIALS.

EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ5	Indoor Chemical & Pollutant Source Control	Pref		System requiring weekly cleaning to earn this credit is not a permitted option unless indicated otherwise.
EQ6.1	Controllability of Systems: Lighting			
EQ6.2	Controllability of Systems: Thermal Comfort			
EQ7.1	Thermal Comfort: Design	Rqd		See paragraph HEATING, VENTILATING AND AIR CONDITIONING.
EQ7.2	Thermal Comfort: Verification			Project must earn credit EQ7.1 to be eligible for this credit. Assume Government will not provide post-occupancy activities unless indicated otherwise.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	Pref		See paragraph DAYLIGHTING.
EQ8.2	Daylight & Views: Views for 90% of Spaces	Pref		
INNOVATION & DESIGN PROCESS				
IDc1.1	Innovation in Design			See paragraph INNOVATION AND DESIGN CREDITS. Assume Government will not provide any activities associated with ID credits.
IDc1.2	Innovation in Design			
IDc1.3	Innovation in Design			
IDc1.4	Innovation in Design			
IDc2	LEED Accredited Professional	Rqd	Rqd	LEED AP during design and construction is required.
REGIONAL PRIORITY CREDITS (Version 3 only)				See paragraph LEED CREDITS COORDINATION.

04 MAY 10

Appendix M

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project: _____

Approved: _____

_____	_____	_____
Name	Owner's Representative	Date
_____	_____	_____
Name	Design Agent's Representative	Date

Overview and Instructions

The purpose of this document is to provide clear and concise documentation of the Owner's goals, expectations and requirements for commissioned systems, and shall be utilized throughout the project delivery and commissioning process to provide an informed baseline and focus for design development and for validating systems' energy and environmental performance.

The Owner's Project Requirements Document is a required document for LEED-NC EA Prerequisite Fundamental Commissioning of the Building Energy Systems. It shall be completed by the Corps District/Design Agent based on coordination with the Installation/User/Proponent and shall be approved by the Installation/User/Proponent representative.

The intent of the Owner's Project Requirements Document is to detail the functional requirements of a project and the expectations of the building's use and operation as it relates to commissioned systems. This template contains the basic recommended components indicated in the LEED Reference Guide. It should be adapted as needed to suit the project, remaining reflective of the LEED intent.

The Owner's Project Requirements Document should ideally be completed before the start of design and furnished to the design team. It must be completed prior to the approval of Contractor submittals of any commissioned equipment or systems to meet LEED requirements.

Updates to the Owner's Project Requirements Document throughout the course of project delivery shall be made by the Corps District/Design Agent based on decisions and agreements coordinated with and agreed to by the Installation/User/Proponent.

The Owner's Project Requirements Document shall be included in the project's LEED documentation file under EA PR1, Fundamental Commissioning of the Building Energy Systems.

04 MAY 10

Owner's Project Requirements Document for LEED Fundamental Commissioning

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 - Building Façade
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 - Accommodations for After-Hours Use
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 - Acoustics
 - Occupant Ability to Adjust System Controls
 - Types of Lighting
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5. Building Occupant and O&M Personnel Requirements
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 - EMCS
 - Occupant Training and Orientation
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TABLE 1

04 MAY 10

1. Owner and User Requirements

What is the primary purpose, program and use of this project? (example: office building with data center)

Describe pertinent project history. (example: standard design development)

Broad Goals

What are the broad goals relative to program needs?

What are the broad goals relative to future expansion?

What are the broad goals relative to flexibility?

What are the broad goals relative to quality of materials?

What are the broad goals relative to construction costs?

What are the broad goals relative to operational costs?

Other broad goals: *(Insert as applicable)*

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2. Environmental and Sustainability Goals

What are the project goals relative to sustainability and environmental issues? (example: LEED Silver rating)

What are the project goals relative to energy efficiency? (example: Meet EPACT)

What are the project goals and requirements for building siting that will impact energy use?

What are the project goals and requirements for building facade that will impact energy use?

What are the project goals and requirements for building fenestration that will impact energy use?

What are the project goals and requirements for building envelope that will impact energy use?

What are the project goals and requirements for building roof that will impact energy use?

Other: *(Insert as applicable)*

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3. Indoor Environmental Quality Requirements

What is the intended use for all spaces? For all spaces that have an intended use that is not readily apparent from the space name, provide this information in Table 1.

What is the anticipated occupancy schedule (numbers of occupants and time frames) for all occupied spaces? Indicate the default occupancy schedule below and for all spaces that have an occupancy schedule that differs from the default, provide this information in Table 1.

What accommodations for after-hours use are required? (example: access control, lighting controls, HVAC controls) Indicate general accommodations required below and for all spaces that have special requirements, provide this information in Table 1.

What are the lighting, temperature, humidity, air quality, ventilation and filtration requirements for all spaces? Indicate the default requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

Lighting: _____

Temperature: _____

Humidity: _____

Air Quality: _____

Ventilation: _____

Filtration: _____

What are the acoustical requirements for all spaces? Indicate the default acoustical requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

What is the desired level of occupant ability to adjust systems controls? Indicate the default desired levels below and for all spaces that have a desired level that differs from the default, provide this information in Table 1.

Lighting: _____

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Temperature: _____

Humidity: _____

Air Quality: _____

Ventilation: _____

What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)

4. Equipment and System Expectations

(Complete for each category as applicable or indicate "none identified" or "N/A". Add desired features information for other anticipated commissioned systems as applicable)

Indicate desired features for the following commissioned system: Space Heating

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Ventilation

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Air Conditioning

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Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Refrigeration

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: HVAC Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Domestic Hot Water

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

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Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Lighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Daylighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Emergency Power

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

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Indicate desired features for the following commissioned system: Other - _____

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

5. Building Occupant and O&M Personnel Requirements

How will the facility be operated? Who will operate the facility?

Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)

What is the desired level of training and orientation for building occupants to understand and use the building systems?

What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

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Table 1

Space	Use / Activity	Num of Occs	Special Occupancy Schedule	After Hours Use Reqmt.	Special Cooling Reqmt.	Special Heating Reqmt.	Special Humidit y Reqmt.	Special Ventil./Filtration Reqmt.	Special Acoustic Reqmt.	Special Lighting Reqmt.	Special Occup Adjustability Reqmt.

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

LEED-NC Version 3.0 Registered Project Checklist

RLSC General Purpose Warehouse PN72838

Joint Base Lewis-McChord, WA

Yes	?	No			
13	13	0	Sustainable Sites	26 Points	Req'd or Preferred

Y			Prereq 1	Construction Activity Pollution Prevention	Required	Contractor
	1		Credit 1	Site Selection	1	USACE TBD
	5		Credit 2	Development Density & Community Connectivity	5	USACE TBD
	1		Credit 3	Brownfield Redevelopment	1	USACE TBD
	6		Credit 4.1	Alternative Transportation , Public Transportation Access	6	USACE TBD
1			Credit 4.2	Alternative Transportation , Bicycle Storage & Changing Rooms	1	Pref
3			Credit 4.3	Alternative Transportation , Low-Emitting and Fuel-Efficient Vehicles	3	Pref
2			Credit 4.4	Alternative Transportation , Parking Capacity	2	Pref
1			Credit 5.1	Site Development , Protect or Restore Habitat	1	Pref
1			Credit 5.2	Site Development , Maximize Open Space**	1	Pref
1			Credit 6.1	Stormwater Design , Quantity Control**	1	Pref
1			Credit 6.2	Stormwater Design , Quality Control**	1	Pref
1			Credit 7.1	Heat Island Effect , Non-Roof	1	Pref
1			Credit 7.2	Heat Island Effect , Roof	1	Req'd
1			Credit 8	Light Pollution Reduction	1	Pref

Yes	?	No			
6	4	0	Water Efficiency	10 Points	

Y			Prereq 1	Water Use Reduction, 20% Reduction	Required	
4	0		Credit 1	Water Efficient Landscaping	2 to 4	Req'd
	2		Credit 2	Innovative Wastewater Technologies	2	
2	2		Credit 3	Water Use Reduction	2 to 4	Req'd (30%), Pref (40%)

Yes	?	No			
22	13	0	Energy & Atmosphere	35 Points	

Y			Prereq 1	Fundamental Commissioning of the Building Energy Systems	Required
---	--	--	----------	---	----------

Y		
Y		
15	4	
	7	
2		
2		
3		
	2	

Prereq 2	Minimum Energy Performance	Required	
Prereq 3	Fundamental Refrigerant Management	Required	
Credit 1	Optimize Energy Performance*	1 to 19	Req'd (40%), Pref (50%)
Credit 2	On-Site Renewable Energy***	1 to 7	USACE TBD
Credit 3	Enhanced Commissioning	2	Req'd
Credit 4	Enhanced Refrigerant Management	2	Pref
Credit 5	Measurement & Verification	3	Pref
Credit 6	Green Power	2	

Yes	?	No
3	5	6

Materials & Resources

14 Points

Y		
		3
		1
1	1	
		2
1	1	
1	1	
	1	
	1	

Prereq 1	Storage & Collection of Recyclables	Required	
Credit 1.1	Building Reuse , Maintain Existing Walls, Floors & Roof	1 to 3	Only in existing structures
Credit 1.2	Building Reuse , Maintain 50% of Interior Non-Structural Elements	1	Only in existing structures
Credit 2	Construction Waste Management	1 to 2	Req'd (50%) Pref (75%)
Credit 3	Materials Reuse	1 to 2	Only in existing structures
Credit 4	Recycled Content***	1 to 2	Pref (10% - 20%)
Credit 5	Regional Materials	1 to 2	Pref (10% - 20%)
Credit 6	Rapidly Renewable Materials	1	
Credit 7	Certified Wood***	1	Pref (if minimal wood on site)

Yes	?	No
10	5	0

Indoor Environmental Quality

15 Points

Y		
Y		
1		
	1	
1		
1		
1		
1		
1		

Prereq 1	Minimum IAQ Performance	Required	
Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required	
Credit 1	Outdoor Air Delivery Monitoring	1	Pref
Credit 2	Increased Ventilation	1	Only pref in BT & Clinics
Credit 3.1	Construction IAQ Management Plan , During Construction***	1	Pref
Credit 3.2	Construction IAQ Management Plan , Before Occupancy***	1	Pref
Credit 4.1	Low-Emitting Materials , Adhesives & Sealants***	1	Pref
Credit 4.2	Low-Emitting Materials , Paints & Coatings***	1	Pref
Credit 4.3	Low-Emitting Materials , Flooring Systems***	1	Pref

1		
1		
	1	
	1	
1		
	1	
	1	
1		

Yes ? No

6	0	0
---	---	---

Innovation & Design Process

6 Points

1		
1		
1		
1		
1		
1		

Yes ? No

2	2	0
---	---	---

Regional Priority

4 Points

1		
1		
	1	
	1	

Yes ? No

62	42	6
----	----	---

Project Totals (pre-certification estimates)

110 Points

Certified 40-49 points **Silver** 50-59 points **Gold** 60-79 points **Platinum** 80-110 points

Credit 4.4	Low-Emitting Materials , Composite Wood & Agrifiber Products***	1	Pref
Credit 5	Indoor Chemical & Pollutant Source Control	1	Pref
Credit 6.1	Controllability of Systems , Lighting	1	Pref (if feasible)
Credit 6.2	Controllability of Systems , Thermal Comfort	1	Pref (if feasible)
Credit 7.1	Thermal Comfort , Design	1	Req'd
Credit 7.2	Thermal Comfort , Verification	1	
Credit 8.1	Daylight & Views , Daylight 75% of Spaces***	1	Pref (if feasible)
Credit 8.2	Daylight & Views , Views for 90% of Spaces	1	Req'd

1	Pref
1	Pref
1	Pref (if feasible)
1	Pref (if feasible)
1	Req'd
1	
1	Pref (if feasible)
1	Req'd

1	All ID credits should be obtained
1	All ID credits should be obtained
1	All ID credits should be obtained
1	All ID credits should be obtained
1	All ID credits should be obtained
1	Reqd

1	RP points TBD
1	RP points TBD
1	RP points TBD
1	RP points TBD

*Minimum required building performance is 40% more efficient than ASHRAE90.1-2007, but LEED calculation includes P&P loads, and is based on \$, whereas the 40% calculation excludes P&P loads, and is based on kW*Hr, so the cited 12 points is approximate.

**Mandate of EISA Section 438 (LID) generally makes these points relatively easy to achieve.

***Though not mandatory, Wizard RFP identifies these points as "required unless prohibited by other elements of the RFP."

LEED Registration of Army Projects

15 April 2010

Typical Registration Procedure

1. Login, complete the online registration form (see guidance below) at the GBCI LEED Online website <http://www.gbci.org/DisplayPage.aspx?CMSPageID=174> and submit it online.
2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
3. GBCI will follow up with a final invoice, the LEED-online passwords and template information.
4. The individual who registers the project online is, by default, the Project Administrator.

Completing the Registration Form

BEFORE YOU BEGIN:

Create a personal account with USGBC if you do not have one.

You will need the following information:

Project name as it appears in P2 (obtain from USACE Project Manager)

Building number/physical address of project

Zip code for Installation/project location

Anticipated construction start and end dates

Total gross area all non-exempt buildings in registration

Total construction cost all non-exempt buildings only (see Project Details

Section instructions below)

ACCOUNT/LOGIN INFORMATION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. Go to <http://www.gbci.org/>, click on "register a project" at the drop-down menu for project certification (at the top of the page) and select "register now for LEED 2009" to start the project registration process. If you have an account, login with your email address and password and select "register new project" to proceed. If you do not a new account" and follow the instructions. It is recommended that you members are members of USGBC and are eligible for Member prices. USACE team members registering projects should be sure to include the USACE Corporate Access ID in their personal account profile (if you do not have it contact richard.l.schneider@usace.army.mil or judith.f.milton@usace.army.mil for the number).
2. The Account/Login Information section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

ELIGIBILITY SECTION

Follow directions (accepting terms and conditions).

Review your profile information and make corrections if needed.

RATING SYSTEM SELECTION SECTION

Select single project registration and I know which rating system.

Select the rating system- currently only LEED-NC and LEED for Homes are approved for Army use without special approval.

LEED Minimum Program Requirements: select YES

RATING SYSTEM RESULTS SECTION

Confirm selected rating system

PROJECT INFORMATION SECTION

Project Title: Begin the project title with a one-word identifier for the Installation. Do not include the word "Fort". After this match the project name used in P2 (contact the USACE Project Manager for this information) and identify the building being registered. Example: "Stewart 4th IBCT - DFAC".

Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever is known to best describe the location of the project on the Installation.

Project City: Installation Name

State, Country, Zip Code: Self-explanatory

Anticipated Construction Start and End Dates: Self-explanatory – give your best guess if unknown.

Note that required data entry format is: 1 or 2 digit month/1 or 2 digit date/4 digit year (example 3/23/2010)

Gross Square Footage: Provide total area all buildings in LEED project. Exclude the area of any buildings that are exempt from the LEED achievement requirement (for example, exclude an unconditioned storage shed to be constructed with a barracks complex).

Is Project Confidential: Indicate NO except, if project has security sensitivity (elements that are FOUO or higher security), indicate YES.

Notification of Local Chapter: YES.

Anticipated Project Type: Select the most appropriate option from the drop- down menu.

Anticipated Certification Level: Select the applicable option from the drop- down menu (Silver is the usual level).

PROJECT OWNER INFORMATION SECTION

Project Owner First Name, Last Name, email, phone, address: The Project Owner is the USACE Project Manager. Obtain this info from the USACE Project Manager.

Organization: U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field by higher HQ to find all USACE registered projects. You may supplement it with district name at the end but DO NOT revise or use an acronym.

May we publish Owner information: Indicate NO

Owner Type: Pick Federal Government from drop- down menu.

Project Owner Assertion: Check the box

PAYMENT INFORMATION

Self-explanatory

APPENDIX Q
REV 2.1 – 30 SEP 2010
AREA COMPUTATIONS

Computation of Areas: Compute the “gross area” and “net area” of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The “gross area” is the sum of all floor spaces with an average clear height $\geq 6'-11"$ (as measured to the underside of the structural system) and having perimeter walls which are $\geq 4'-11"$. The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating “gross area”:

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- **Covered but not enclosed spaces, canopies, training, and assembly areas**
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the “gross area” calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, “net area” is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall “assignable net area” is determined by subtracting the following spaces from the “gross area”:

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

RMS SUBMITTAL REGISTER INPUT FORM			CONTRACT NUMBER		DELIVERY ORDER																				
TITLE AND LOCATION					Page 372 of 596																				
Button	<-----Right click for Instructions		TYPE OF SUBMITTAL								CLASSIFICATION				REVIEWING OFFICE										
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	01 - PRECON SUBMITTALS	02 - SHOP DRAWINGS	03 - PRODUCT DATA	04 - SAMPLES	05 - DESIGN DATA	06 - TEST REPORTS	07 - CERTIFICATES	08 - MFRS INSTRUCTIONS	09 - MFRS FIELD REPORT	10 - O&M DATA	11 - CLOSEOUT SUBMITTALS	FO - FOR INFORMATION ONLY	GA - GOVERNMENT APPROVED	DA - DESIGNER OF RECORD APPROVAL	CR - CONFORMANCE REVIEW	DA / CR	DA / GA	DO - DISTRICT OFFICE	AO - AREA OFFICE	RO - RESIDENT OFFICE	PO - PROJECT OFFICE	DR - DESIGNER OF RECORD	AE - ARCHITECT / ENGINEER
00 72 00	52.236-13	Accident Prevention Plan	X													X				X					
00 73 00	1.11	Dev. From Accept. Design. No Deviation from Contract					X										X			X				X	
00 73 00	1.11	Dev. From Accepted Design - Deviates from Contract					X											X		X				X	
00 73 00	1.17	Supplemental Price Breakdown	X											X						X					
00 73 00	1.18	SSHO Qualifications	X												X					X					
01 10 00	5.2.3.1	(if concrete pavement) Joint Layout Plan with design drawings					X									X									
01 10 00	5.5.2	Building Envelope Sealing Performance Testing						X						X						X					
01 10 10	***	Tests as Req by Codes - DOR Develops Test Program						X						X						X			X		
01 10 00	5.8.3	BAS Review Information		X										X						X	X			X	
01 10 00	5.8.3	BAS Performance Verification Test						X						X						X	X			X	
01 10 00	5.8.4	Testing Adjusting and Balancing						X						X						X			X		
01 10 00	5.8.5	Commissioning						X						X						X			X		
01 10 00	6.15	Environmental As Required for Site Specific					X									X				X	X			X	
01 10 00	6.16	Permits as required for Site specific					X									X				X			X		
01 10 00	5.10.2	Fire Protection Tests						X	X					X						X			X		
01 32 01.00 10	3.4.1	Preliminary Project Schedule	X												X					X					
01 32 01.00 10	3.4.2	Initial Project Schedule	X												X					X					
01 32 01.00 10	3.4.3	Design Package Schedule	X												X					X					
01 32 01.00 10	3.6.1	Periodic schedule updates from the Contractor	X												X					X					
01 32 01.00 10	3.7	Time Extension Request (Schedule)	X												X					X					
01 33 00	1.8	Submittal Register - DOR Input Required	X												X					X			X		
01 33 00	1.8	Submittal Register Updates (Design Packages, etc.)	X												X					X			X		
01 33 00	1.3.1	Substitution of Manuf or Model Named in Proposal		X	X												X			X			X		
01 33 16	1.2	Identify Designer(s) of Record	X												X					X				X	
01 33 16	1.1.2 / 3.2.4	Fast Track Design Package(s)					X									X			X	X					
01 33 16	1.2	Identification of all Designers of Record	X													X				X					
01 33 16	3.2.1	Site and Utility Des Package, incl. Substantiation					X									X				X	X				
01 33 16	3.2.2/3.5	Interim Des Subm Package(s), incl. Substantiation					X									X				X	X				
01 33 16	3.5.1	Drawings					X									X				X	X				
01 33 16	3.5.2.2	Sitework Design Analyses					X									X				X	X				
01 33 16	3.5.2.3	Structural Design Analyses					X									X				X	X				
01 33 16	3.5.2.4	Security Design Analyses					X									X				X	X				
01 33 16	3.5.2.5	Architectural Design Analyses					X									X				X	X				
01 33 16	3.5.2.6	Mechanical Design Analyses					X									X				X	X				
01 33 16	3.5.2.7	Life Safety Design Analyses					X									X				X	X				
01 33 16	3.5.2.8	Plumbing Design Analyses					X									X				X	X				
01 33 16	3.5.2.9	Elevator Design Analyses (as Applicable)					X									X				X	X				
01 33 16	3.5.2.10	Electrical Design Analyses					X									X				X	X				
01 33 16	3.5.2.11	Telecommunications Design Analyses					X									X				X	X				
01 33 16	3.5.2.12	Cathodic Protection Design Analyses					X									X				X	X				
01 33 16	3.5.3	Geotechnical Investigations and Reports					X									X				X	X				
01 33 16	3.5.4	LEED Submittals					X									X				X	X				
01 33 16	3.5.5	Energy Conservation Documentation					X									X				X	X				
01 33 16	3.5.6	Specifications					X									X				X	X				
01 33 16	3.5.7	Building Rendering					X									X				X	X				
01 33 16	3.2.4/3.7	Final Des Submittal Package(s), incl. Substantiation					X									X				X	X				
01 33 16	3.7.5	DD Form 1354 (Transfer of Real Property)										X				X				X					
01 33 16	3.7	Independent Technical Review					X									X				X	X				
01 33 16	3.2.5/3.8	Design Complete Submittal Package(s)					X									X				X	X				
01 33 16	3.3.3	Design and Code Review Checklists					X									X				X	X				
01 33 16	A-2.0	SID - Interim and Final (as applicable)		X	X		X								X					X					
01 33 16	B-2.0	FFE (as Applicable)					X								X					X					
01 33 16	F-3.1.3	BIM Model and data					X									X				X	X				
01 45 04.00 10	3.2	Design and Construction QC Plan	X													X				X					
01 57 20.00 10	1.2	Environmental Protection Plan	X													X				X					
01 78 02.00 10	1.2.1	Final as-Built Drawings/ BIM Model										X		X											
01 78 02.00 10	1.2.3.11	Non-Hazardous Solid Waste Diversion Reports						X					X								X				
01 78 02.00 10	1.2.7	Provide final as-built CADD and BIM Model files											X		X						X				
01 78 02.00 10	1.2.9	Provide scans of all other docs in Adobe.pdf format											X		X						X				
01 78 02.00 10	1.3.1	Equip-in-Place list of all installed equip and cost											X		X						X				
01 78 02.00 10	1.3.2	Data on equip not addressed in O&M manuals											X		X						X				
01 78 02.00 10	1.3.3	Final as-built specs - electronic files											X		X						X				
01 78 02.00 10	1.4.2.1	Warranty management plan - FAR 52.246-21											X		X						X				
01 78 02.00 10	1.4.2.1	Certificates of Warranty for extended warranty items											X		X						X				
01 78 02.00 10	1.4.2.1	Contractor's POCs for implementing warranty process											X		X						X				
01 78 02.00 10	1.4.2.1	List of each warranted equip, item, feature or system											X		X						X				
01 78 02.00 10	1.5	See also Section 01 10 00 par. 5.8.4 and 5.8.5											X		X						X				
01 78 02.00 10	1.6.1.2	Equipment O&M Manuals - 1 electronic / 2 hard copies											X		X						X				
01 78 02.00 10	1.7	Field Training DVD Videos									X			X							X				
01 78 02.00 10	1.8	Pricing of CF/CI and GF/CI Property											X		X						X				
01 78 02.00 10	1.11	List of Completed Cleanup Items											X			X					X				

Appendix S

REV 1.1 JUL 2011.

Manufacturing Performance Requirements for Plumbing Fixtures From The Energy Policy Act of 1992 (PL 102-486) (Including Exceptions for Projects Registered for LEED 3.0 or higher)

Note: This information is for use in establishing the Baseline to calculate flow rate reductions from said Baseline, where required by the contract.

Subtitle C--Appliance and Equipment Energy Efficiency Standards

SEC. 123. ENERGY CONSERVATION REQUIREMENTS FOR CERTAIN LAMPS AND PLUMBING PRODUCTS.

... (j) STANDARDS FOR SHOWERHEADS AND FAUCETS- (1) The maximum water use allowed for any showerhead manufactured after January 1, 1994, is 2.5 gallons per minute when measured at a flowing water pressure of 80 pounds per square inch. Any such showerhead shall also meet the requirements of ASME/ANSI A112.18.1M-1989, 7.4.3(a).

`(2) The maximum water use allowed for any of the following faucets manufactured after January 1, 1994, when measured at a flowing water pressure of 80 pounds per square inch, is as follows:

`Lavatory faucets: 2.5 gallons per minute **(BUT SEE BELOW**)**

`Lavatory replacement aerators: 2.5 gallons per minute

`Kitchen faucets : 2.5 gallons per minute

`Kitchen replacement aerators: 2.5 gallons per minute

`Metering faucets: 0.25 gallons per cycle

`(k) STANDARDS FOR WATER CLOSETS AND URINALS- (1)(A) Except as provided in subparagraph (B), the maximum water use allowed in gallons per flush for any of the following water closets manufactured after January 1, 1994, is the following:

`Gravity tank-type toilets --1.6 gpf.

`Flushometer tank toilets --1.6 gpf.

`Electromechanical hydraulic toilets --1.6 gpf.

`Blowout toilets --3.5 gpf.

`(B) The maximum water use allowed for any gravity tank-type white 2-piece toilet which bears an adhesive label conspicuous upon installation consisting of the words `Commercial Use Only' manufactured after January 1, 1994, and before January 1, 1997, is 3.5 gallons per flush.

`(C) The maximum water use allowed for flushometer valve toilets, other than blowout toilets, manufactured after January 1, 1997, is 1.6 gallons per flush.

`(2) The maximum water use allowed for any urinal manufactured after January 1, 1994, is 1.0 gallon per flush.

**** EXCEPTIONS for Projects Registered under LEED 3.0 or higher.**

1. Any exceptions identified in the applicable LEED criteria.
2. Public lavatory faucets shall deliver a maximum flow rate of 0.5 gallons per minute, when tested in accordance with ASME A 112.18/CSA B125. Use that flow rate as the Baseline figure for calculating any required reductions from the Baseline.

APPENDIX T

FUNCTIONAL AREA LIGHTING CONTROL STRATEGY (FALCS)

A. GENERAL LIGHTING CONTROL SYSTEM ENERGY MANAGEMENT STRATEGIES

SUMMARY: This appendix describes various lighting energy management strategies to utilize across functional areas. These strategies are intended to supplement and NOT supersede the requirements of ASHRAE 90.1.

1. Consider **LIGHT LEVEL TUNING** to maintain the appropriate light level for a given space. Initial light levels are set high to compensate for light depreciation over time. Where dimming ballasts or dimmable LED drivers are used, they shall be digital and addressable in nature (where available) that can provide individual fixture light level tuning and reconfigurability that dims the light level to the target level, saving the energy that otherwise would be used to compensate for future light depreciation. Provide a life-cycle cost-benefit analysis (LCCBA) of light level tuning for all spaces where the general lighting luminaires are equipped with digital addressable dimming ballasts or LED drivers. The LCCBA shall follow the methodology contained in the IESNA Lighting Handbook. Provide light level tuning where the LCCBA shows it to be economical.
2. Use **OCCUPANCY/VACANCY SENSORS** to automatically turn off lighting a specified time after all occupants leave the space. The off time shall be adjustable settable to 1, 5, 15, or 30 minutes. Select the type (single or dual technology, wired or wireless) based on the use and configuration of the space. Lighting control system shall have the capability to manage both hard-wired and wireless sensors where applicable. Single technology solutions shall incorporate signal processing technology that distinguishes between background noise and actual motion without automatically changing their sensitivity threshold. To maximize energy savings potential, all occupancy sensors shall be either **MANUAL ON – AUTOMATIC OFF** (vacancy sensor) or **AUTOMATIC ON** (to a specified light level of 50% or less) – **AUTOMATIC OFF** to maximize energy savings. Occupancy/Vacancy sensors properly located in the space and set appropriately can offer typical lighting energy savings of 15% or more.
3. Use **DAYLIGHT HARVESTING** to control lighting in areas within at least two window head heights (head height is the distance from the floor to the top of the glazing) adjacent to exterior view windows. Typical daylight penetrates three times the window head height into the space. To maximize energy savings, daylight dimming strategies need to penetrate beyond the first row of luminaires (first daylight zone). When daylighting installed fluorescent or LED luminaires, accomplish daylight harvesting by digitally addressable dimming ballasts or drivers. As the natural light in the space increases, the artificial light level should dim gradually to maintain a uniform light level and prevent disruption to the occupants. One daylight sensor must be able to control multiple daylighting zones (cross-zoning) without the need of adding more sensors. All controls (daylight sensors, occupancy sensors, wall stations) shall have the capability to connect to the system via hard wire or wireless. Apply the same daylighting strategies to areas where skylights are available (refer to ASHRAE 189.1 daylight zone definitions). Daylighting systems properly tuned and calibrated can offer typical lighting energy savings of 15% or more.
4. Consider **AUTOMATED SHADING** in spaces utilizing daylight harvesting to maximize the energy savings of the day lighting system. The shades shall be controlled to reduce glare and unwanted heat gain while still allowing natural light to enter the space. When utilizing automated shading consider the following :
 - A. For ease of use and space aesthetics, operate the automated shades by common controls, wired or wireless (i.e. same appearance and design) with the lighting control system.
 - B. For maximum energy savings the automated shading system shall predictably position the shades based on a combination of time of day, façade direction, and sky conditions.
 - C. For maximum design flexibility and ease of installation, shade system should have the capability to address and control each shade individually.
 - D. The shading system shall have a manual override that allows the occupant to temporarily adjust the shades to any desired position. The system will revert back to automatic control after a specified period of time.

Provide a life-cycle cost-benefit analysis (LCCBA) of automated shading for all spaces where daylight harvesting is provided. The LCCBA shall follow the methodology contained in the IESNA Lighting Handbook. Provide automated shading where the LCCBA shows it to be economical.

5. Use SCENE BASED DIMMING in multiple-use areas including auditoriums, conference rooms and classrooms. Also provide scene based dimming in dining rooms and gymnasiums with multiple functions. One button preset touch recall shall allow multiple zones of light within a space to go to the appropriate light levels, known as a scene, for a specific task or use. Scene based control shall allow the integration of AV controls, shading/projection screens and lighting to work seamlessly with one button preset touch (i.e. lights dim, projection screen lowers, and shades go down). If dimming ballasts or LED drivers are used, they shall also be digital and addressable in nature (where available) to take advantage of installation and life-cycle reconfiguration benefits.
6. Provide PERSONAL CONTROL of lighting in spaces to allow the user of the space to vary the general light level based on the task at hand. Personal control can be achieved by wall mounted controls (hard wired or wireless), Infrared or Radio Frequency (RF) wireless devices, or via computer. Digital addressable ballasts and LED drivers allow the control flexibility of personal dimming of installed lighting on the occupant's work area (i.e. dim the luminaire over their cubicle to the appropriate light level).
7. Consider WIRELESS lighting control options for all installations, including retrofit projects (easy installation, lower installed cost, no power packs necessary). Wireless products shall include but not be limited to occupancy / vacancy sensors, daylight sensors, local wall controls, plug in switching and dimming appliance and parasitic load modules. To avoid interference, wireless products should communicate in an FCC frequency band that does not allow continuous transmissions and is free of Wi-Fi devices.

B. FUNCTIONAL TESTING AND MANUFACTURER SUPPORT

SUMMARY: This section describes functional testing to be performed on the lighting control system and the support required from the lighting control manufacturer.

1. Hire an independent agent with no less than three years experience in testing of complex lighting control systems to conduct and certify functional testing of lighting control devices and control systems. The testing agent shall not be directly involved in either the design or construction of the project and shall certify the installed lighting controls meet or exceed all requirements of ASHRAE 90.1 and all documented performance criteria. The lighting control manufacturer's authorized technical representative may serve as the testing agent. Submit qualifications of the testing agent for approval. Submit copies of test results to the Government.
2. LIGHTING CONTROL MANUFACTURER SUPPORT shall include technical phone support located in the United States. The technical phone support shall be available 24 hours a day, 365 days a year.

APPENDIX AA – Example Tree Preservation Plan

SAMPLE TREE PRESERVATION PLAN

1.0 GENERAL CONDITIONS

A. Strict adherence to the Tree Preservation Plan, details and specifications will be enforced. If plans have not been prepared, owner is responsible to contract with a qualified professional to prepare a Tree Preservation Plan. All plans shall include identification of the individual trees to receive tree care as per these guidelines. If any deviation from the approved Plan, details and specifications occurs, the general contractor shall notify the qualified professional to determine what action should be taken.

B. Prior to any site disturbance, it shall be the responsibility of the general contractor to install tree preservation measures in accordance with plans and specifications prepared by a qualified professional. It is the general contractor's responsibility to safeguard the trees designated to be preserved.

C. The following must not occur within the tree protection area:

1. stockpiling of soils
2. operating or storing construction equipment
3. burning in close proximity to protected areas
4. regrading causing runoff or flooding
5. parking vehicles and storing supplies
6. spilling of toxic materials
7. spraying of herbicides in close proximity to protected areas

D. Fines for non-compliance with the Tree Preservation Plans and penalties for any trees lost due to negligence will be assessed according to the local governing agency's regulations.

1.1 SCOPE OF WORK

The landscape contractor shall provide all materials, labor and equipment to complete all tree preservation work as shown on the plans and specifications. This work may include site preparation, hardscape, grading, drainage, aeration, dewatering and fertilization. It is recommended that work on individual trees be performed by a certified arborist.

1.2 DEFINITIONS

A. **DIAMETER** (dbh - diameter at breast height) is used when measuring trees over 12 inches in diameter when measured at 4.5 feet above the ground.

B. **CALIPER** is the diameter of a tree trunk less than 12 inches in diameter.

C. **SPECIMEN TREES**: Trees having a diameter of 30 inches or more, or trees having 75 percent or more of the diameter of the current state champion tree for that species.

D. **CRITICAL ROOT ZONE** (crz) is equal to one foot radius for every 1 inch of dbh, except for isolated specimen trees which shall have a crz of 1.5 foot radius for each 1 inch dbh. For example, 30 inch dbh shall have a crz of 45 foot radius. Refer to Tree Preservation plan for delineation of the crz.

E. **DAMAGE** is any encroachment into the critical root zone.

F. **QUALIFIED PROFESSIONAL** shall be a registered landscape architect, licensed forester or other specialists recognized by the local regulatory agencies.

1.3 MATERIALS

A. Barricades/Fences: Chain link, welded wire, board or other approved product. Minimum height shall be 4 feet.

B. Cable, extra high strength steel, with pre-formed grip and drop forged attachments.

C. Erosion Control Bales: straw bales anchored by wood stakes or rebar.

D. Signage attached to tree protection fence: 11 inches x 15 inches or larger, highly visible to the public and contractors.

E. Silt Fence, as specified, example 30-inch or 4-foot woven fabric.

F. Fertilizer: 50 percent organic, slow release, granular or water soluble as dictated by plans and specifications or per soil test, arboricultural grade 32-7-7 or equivalent.

1.4 TREE PRESERVATION PROCEDURES

A. Stakeout

1. Upon issuance of the clearing, grading and sediment and erosion control permits by the plan review authorities, the general contractor shall stakeout the limits of clearing, grading, building footprints, sediment and erosion control devices that affect the tree preservation areas. In addition, the general contractor shall indicate pertinent floor grades on the stakeout.

2. After this procedure is completed, the general contractor shall stakeout (separate color code) the location of all tree preservation fencing.

3. The landscape contractor shall be required to meet onsite with the owner's representative, the qualified professional who prepared the Tree Preservation Plan and the local code enforcement officer to inspect the trees to be saved and to review the protective measures required.

B. Selective tree removal within the Tree Preservation area

1. Within the tree preservation area, selected trees and brush as identified on the Tree Preservation Plan, may be removed by hand under the direction of the qualified professional.
2. All final stump cuts are to be made as close as possible to the existing grade.

C. Tree removal and site work outside the tree preservation area

1. All areas designated to be root pruned as detailed on the Tree Preservation Plan shall have the work performed at this time. If trenching to root prune, proper backfill procedures, including the layering of backfill and tamping to eliminate settlement, must be done.
2. All tree protection fencing, silt fencing and signage as detailed on the Tree Preservation Plan shall be installed prior to any clearing or grading.
3. All trees removed outside the tree protection fencing shall be taken down without encroachment into the tree preservation area. If stump removal becomes necessary, appropriate precautions should be taken to ensure that the crz is not disturbed.

D. Tree Maintenance Activities

1. All tree maintenance shall be carried out under the supervision of a certified arborist. All work performed shall meet or exceed the standards established by the National Arborist Association. All applicable safety requirements shall be strictly adhered to and enforced.
2. Pruning activities shall be performed on all trees as detailed on the Tree Preservation Plan maintenance schedule. Trees will be pruned to National Arborist Association pruning standards Classes I - IV.
3. Apply fertilizer as specified on the Tree Preservation Plan. Fertilizer shall be applied in late fall or early spring according to manufacturer's recommendations.
4. During periods of moisture stress, trees shall be watered whenever soil moisture content is below 50 percent of field capacity. This watering will result in additional cost to the owner as outlined in the contract documents.

5. Root area of trees where soil has been compacted due to construction activity shall be vertically mulched (aerated) at direction of the qualified professional. This shall be accomplished by auguring the soil in a 2-foot grid pattern to within 3 feet of trunk and to 10 feet beyond the drip line. A 2-inch to 3-inch hand operated augur shall be used to drill holes to a minimum depth of 12 inches. Type of backfill will be determined by the qualified professional. If this procedure is not addressed on the Tree Preservation Plan, it will result in additional cost to the owner.

6. Any trees whose trunks, limbs or roots are damaged during construction shall be treated within 24 hours. The party responsible for such damage will incur all costs associated with treatment.

7. Heavy accumulation of dust from construction activity may occur on the surface of tree foliage. To control dust, tree foliage may be hosed down upon the request of the qualified professional. This procedure will result in an additional cost to the owner as outlined in the contract documents.

E. Removal of all tree protection fencing, silt fencing and signage will be done by the general contractor when permitted by the local code enforcement officials. Restoration of all areas disturbed by the fencing and/or signage will be the general contractor's responsibility.

End of Tree Preservation Plan

APPENDIX BB

Amendment to SECTION 01 10 00 Paragraph 5 and 6

Amendments to Section 01 10 00 Paragraphs 5 and 6

SECTION 011000 Paragraph 5.6.7. **EDIT:** URINALS: Urinals shall be vitreous china, wall-mounted, wall outlet, and conform to ANSI/ASHRAE/USGBC/IES Standard 189,1-2009, Standard for the Design of High-Performance Green Buildings (Except Low-Rise Residential Buildings), American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and US Green Building Council, Dec 09. Install, test and maintain in accordance with..."

SECTION 01 10 00 Paragraph 5.7.6.2, 6.9.2 **ADD:** BICSI Certified RCDD/OSP Technician shall review all telecommunication submittals for compliance with the contract specifications and codes and provide a response to all requests for information dealing with communications issues as the recommendation of the contractor. The entire communications OSP and ISP shall be inspected periodically during construction and at the contractor's pre-final to insure compliance with the I3A and all other applicable codes (EIA/TIA/NEC/NFPA, etc.). A detailed report shall be provided to the Government after each inspection by the Certified RCDD/OSP Technician indicating the deficiencies noted, and the Certified RCDD/OSP Technicians recommended corrective actions. Within 10 days of the Governments final inspection of the facilities, the contractor shall provide to the Government a signed statement from the Certified RCDD/OSP Technician that the entire communications OSP and ISP have been inspected and certified that all deficiencies have been corrected, and that the installation is in accordance with the I3A and all other applicable codes and is ready for occupancy.

SECTION 01 10 00 Paragraph 6.4.6.4 (c) - **NOT USED.**

SECTION 01 10 00 Paragraph 6.4.9 Haul Routes and Staging Areas **REPLACE:** Adhere to haul route and laydown areas as directed by the Contracting Officer. Laydown areas are shown on drawings in **Appendix J**. Restore the laydown areas to their original condition after construction is complete.

SECTION 01 10 00 Paragraph 6.4.6.2(e) - **NOT USED.**

SECTION 01 10 00 Paragraph 6.4.11.2 - **NOT USED.**

SECTION 01 10 00 Paragraph 6.4.11.4(g) 6. – **REPLACE:** Groundcovers: 4" pots (or larger) at 18" on center minimum.

SECTION 011000 Paragraph 6.8.1.5. **ADD:** Urinals in Army facilities will comply with ANSI/ASHRAE/USGBC/IES Standard 189 1-2009, Standard for the Design of High Performance Green Buildings (Except Low-Rise Residential Buildings), American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and US Green Building Council, Dec 09.

SECTION 011000 Paragraph 6.4.11.2. **REPLACE:** Preserve Oregon White Oak trees (*Quercus garryana*) that have a diameter of 6 inches or greater. Replace oak trees that cannot be preserved at the ratio of six new Oregon White Oaks for every one removed. In accordance with the attachment entitled "Attachment for Joint Base Lewis-McChord Oregon White Oak Planting Plan" included in Appendix **HH**. Contact the Contracting Officer for guidance on locations for planting new oak trees.

HAZARDOUS BUILDING MATERIALS SURVEY

**Demolish Well House Building 9004,
Building 9508, and Building 9513
Contract No. W912DW-10-D-1003
Joint Base Lewis/McChord, Washington**

Prepared for:

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Med-Tox Northwest Project No. : A-7198.6

January 31, 2011



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Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

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Acronyms

AAS	atomic absorption spectroscopy
ACM	asbestos-containing materials
ACT	acoustical ceiling tile
AHERA	Asbestos Hazard Emergency Response Act
ASHARA	Asbestos Schools Hazard Abatement Reauthorization Act
ASTM	American Society of Testing and Materials
CAB	cement asbestos board
CMU	cement masonry unit
CFC	chlorofluoro carbons
CFR	Code of Federal Regulation
CTED	Community, Trade, and Economic Development
DEHP	Di (2-ethylhexyl) phthalate
ECD	electron capture detectors
EPA	U.S. Environmental Protection Agency
GC	gas chromatography
HBM	hazardous building materials
HID	high intensity discharge
HM	homogeneous material
HVAC	heating, ventilation, and air-conditioning
LBP	lead-based paint
MAP	Metals Analysis Probe
mg/cm ²	milligrams per square centimeter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTNW	Med-Tox Northwest
NVLAP	National Voluntary Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
ppm	parts per million
PSCAA	Puget Sound Clean Air Agency
TCLP	toxicity characteristic leaching procedure
TSI	thermal system insulation
WAC	Washington Administration Code
WISHA	Washington Industrial Safety and Health Administration



Survey Summary

On January 6, 2011, Anthony Fullerton and Ingrid Holznagel of Med-Tox Northwest (MTNW) conducted a renovation specific hazardous building materials (HBM) survey of the Well House Building 9004, Building 9513, and Building 9508 at Joint Base Lewis/McChord, Washington. This survey was performed for demolition of the buildings.

The survey included asbestos, lead-based paint (LBP), and other potential HBM such as polychlorinated biphenyl (PCB) in light ballasts, mercury-containing fluorescent tubes and/or thermostats. Waste designation was performed for construction debris based on segregation of concrete and metal products and toxicity characteristic leaching procedure (TCLP) analysis for the Well House Building 9004.

Extensive destructive investigation, including roof sampling and waste designation sampling was not performed for Buildings 9513 and 9518 under the request of maintenance personnel and based on the nature of stored contents in the buildings. These buildings were fenced off and marked as containing radioactive materials and only non-destructive investigation and sampling was permitted.

This asbestos survey consisted of a visual inspection, touching of suspect materials, and sample collection with analysis. As-built drawings were not provided for this survey. Copies of the inspectors' Asbestos Hazard Emergency Response Act (AHERA) building inspector certificates and Community, Trade, and Economic Development (CTED) Risk Assessor certificate is included in **Appendix A**.

Building Information

Photographic documentation of the Well House Building 9004 and its major systems described herein are provided in **Appendix B**. Building photo documentation of materials for Building 9508 and Building 9513 was not performed based on the nature of stored building contents and per request of maintenance personnel.

General and Structural

Well House Building 9004. Well House Building 9004 is a one-story, cement masonry unit (CMU) building on concrete slab foundation and was formerly used as a well house. It is approximately 386 square feet in size and consists of three rooms, including one with well piping and electrical panels. There is no heat source provided for this building. Floors are bare concrete. Interior walls are unpainted CMU (one room has a partial painted wood wall and platform) and ceiling finishes are painted wood panels. The roof is slanted with built-up roofing over wood framing with metal flashing. There a total of four doors with ACM gray door frame caulk. Pipes are un-insulated; however, steel



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

pipng on the floor of room 1 as well as exterior well pipes has asbestos-containing material (ACM) gaskets. Building 9004 does not have windows.

Building 9508. Building 9508 is a one-story CMU building on concrete slab foundation. It is a one room building used for storage. It is located adjacent to building 9513 and is approximately 175 square feet in size. Radioactive materials were once stored at this building; therefore the building is demarcated as containing radioactive materials and is fenced off. There is no heat source provided for this building. Floors are bare concrete. Interior walls are un-painted. The roof was inaccessible at the time of the survey, but is assumed ACM built-up roofing with a two-foot wood overhang. Building 9508 does not have windows.

Building 9513. Building 9513 is a one-story, CMU building on concrete slab foundation and is used a storage. It is approximately 540 square feet in size and consists of four storage rooms and one decon shower room. Radioactive materials were once stored at this building; therefore the building is demarcated as containing radioactive materials and is fenced off. There is no heat source provided for this building. Floors are concrete with an epoxy-type coating. Interior walls are painted CMU with upper painted wood walls and a wood ceiling. The roof was inaccessible at the time of the survey, but is assumed ACM built-up roofing with a three-foot wood overhang. Room two has fiberglass insulated pipes with ACM hard fittings. Building 9513 does not have windows.

Asbestos Summary

The AHERA regulation, 40 Code of Federal Regulations (CFR) 763, is the primary governing regulation when performing asbestos surveys. This regulation was originally enacted for school buildings, but has since been applied to public and commercial buildings by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA) in 1994 and by the Occupational Safety and Health Administration's (OSHA) worker protection regulations in 1995, specifically 29 CFR 1926.1101(k).

Puget Sound Clean Air Agency (PSCAA) also requires compliance with AHERA's survey and sampling requirements. This applies to any renovation or demolition activities where suspect asbestos-containing material (ACM) may be disturbed. PSCAA is a local agency that receives statutory authority from the EPA to enforce environmental regulations.

AHERA divides suspect ACM into three categories; "*surfacing materials*" (i.e., sprayed fireproofing, popcorn ceiling texture, etc.), "*thermal system insulation*" (TSI) (i.e., pipe or building insulation, etc.), and "*miscellaneous materials*" (i.e., flooring material, roofing, construction mastics, etc.). Well House Building 9004, Building 9513, and Building 9508 were surveyed for these materials and sampled as required (28 samples collected). For a complete listing of suspect materials sampled, see **Appendix C**.



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

Sampling locations are indicated on drawings in **Appendix D**.

Table 1 below provides a summary of asbestos materials identified in the building from existing surveys and the results of sampling by Med-Tox Northwest. These materials will need to be removed prior to building demolition.

Table 1. Summary of Asbestos-Containing Materials.

Material	Location	Friable	Quantity
Well House Building 9004			
Exterior door frame caulk and wall seams	Exterior doors and wall seams	No	320 LF
Gaskets	Well House pipes-interior and exterior of building	No	21 EA
Fire doors (assumed)	Exterior doors	Yes	4 EA
Building 9508			
Built-up roofing (assumed)	Roof	No	175 SF
Fire doors (assumed)	Exterior doors	Yes	2 EA
Building 9513			
Pipe fitting insulation	Room 2	Yes	13 EA
Built-up roofing (assumed)	Roof	No	540 SF
Fire doors (assumed)	Exterior doors	Yes	6 EA

EA= each, LF= linear feet, SF= square feet

Note: This table is not to be used without the complete survey document including appendices for additional information.

Surfacing Materials

Well House building 9004

- Coating on CMU. This coating material is located on the exterior CMU walls of the Well House Building 9004. Three samples were collected and analyzed for asbestos content; no asbestos was detected.

Building 9508

- Coating on CMU. This coating material is located on the exterior CMU walls of Building 9508. Three samples were collected and analyzed for asbestos content; no asbestos was detected.

Building 9513

- Coating on CMU. This coating material is located on the exterior CMU walls of Building 9513. Three samples were collected and analyzed for asbestos content; no asbestos was detected.



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

- Floor coating. This epoxy-type floor coating is located throughout Building 9513. Three samples were collected and analyzed for asbestos content; no asbestos was detected

Thermal System Insulation

Building 9513

- Fiberglass insulation. This material is located on pipes in room 2 of Building 9513. Fiberglass insulation was visually determined non-asbestos containing.
- TSI pipe fittings. This hard fitting material is located on pipes in room 2 of Building 9513 (total of 13). Three samples were collected and analyzed for asbestos content; this material was found to contain **4% to 7% Chrysotile asbestos** and **3% Amosite asbestos**.

Miscellaneous Materials

Well House Building 9004

- CMU grout. This material is located on the exterior CMU walls of the Well House Building 9004. Two samples were collected and analyzed for asbestos content; no asbestos was detected.
- Expansion joint compound. This material is located on the interior perimeter of the Well House Building 9004. Two samples were collected and analyzed for asbestos content; no asbestos was detected.
- Built-up roofing. This material is located on the roof of the Well House Building 9004. One sample was collected and analyzed for asbestos content; no asbestos was detected.
- Door frame/wall seam caulk. This material is located on the exterior doors and wall seams of the Well House Building 9004. Two samples were collected and analyzed for asbestos content; this material was found to contain **3% Chrysotile asbestos**.
- Black sealant on insulation. This material is located on foil insulation located in room 1 of the Well House Building 9004. One sample was collected and analyzed for asbestos content; no asbestos was detected.
- Gasket on well house pipe. This material is located on steel well pipes in room one and on the on pipes outside the Well House Building 9004. One sample was collected and analyzed for asbestos content; this material was found to contain **22% Chrysotile asbestos**.
- Fire doors and frames. There are doors observed in the Well House Building 9004 as potential fire doors. These doors were not sampled due to the destructive nature of the sampling. These doors are assumed to contain asbestos.



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

Building 9508

- CMU grout. This material is located on the exterior CMU walls of Building 9508. Two samples were collected and analyzed for asbestos content; no asbestos was detected.
- Fire doors and frames. There are doors observed in Building 9508 as potential fire doors. These doors were not sampled due to the destructive nature of the sampling. These doors are assumed to contain asbestos.

Building 9513

- CMU grout. This material is located on the exterior CMU walls of Building 9513. Two samples were collected and analyzed for asbestos content; no asbestos was detected.
- Fire doors and frames. There are doors observed in Building 9513 as potential fire doors. These doors were not sampled due to the destructive nature of the sampling. These doors are assumed to contain asbestos.

Table 2 below lists all suspect materials that have been determined non-asbestos based on sampling performed by Med-Tox Northwest.

Table 2. Summary of Suspect Materials Determined Non-Asbestos.

Material	Material
CMU coating-Well House Bldg 9004	CMU coating-Bldg 9508
CMU grout-Well House Bldg 9004	CMU grout-Bldg 9508
Expansion joint compound-Well House Bldg 9004	Floor coating-Bldg 9513
Built-up roofing-Well House Bldg 9004	CMU coating-Bldg 9513
Black sealant on insulation-Well House Bldg 9004	CMU grout-Bldg 9513

Note: This table is not to be used without the complete survey document including appendices for additional information.

Lead-Based Paint Summary

Lead was commonly used in most paint products until 1978, when it was banned from residential paints at concentrations greater than 600 parts per million (ppm); however, commercial applications with lead were still utilized and are still available. Lead is poisonous to the human body and presents a potential health hazard during any kind of disturbance (such as maintenance, including grinding, welding, and cutting) and if improperly disposed, where lead can enter drinking water supplies.

The Environmental Protection Agency (EPA) defines lead-based paint as a concentration of 1.0 milligram per centimeter squared (mg/cm²) or greater by X-Ray fluorescence (XRF) or 0.5 percent by weight or greater by total lead analysis (equivalent



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

to 5,000 mg/kg). This EPA action level triggers requirements for protection of the environment, maintenance workers, and building occupants. It also triggers training and certification requirements for inspectors, project designers, contractors, supervisors, and workers. Although the training requirements only apply to certain residential structures at this time, they could apply to this type of property sometime in the future.

The Washington Industrial Safety and Health Administration (WISHA) worker protection regulations has not defined a minimum concentration for regulating lead, and has clarified that lead at any detectable concentration shall be considered regulated (Washington Administrative Code [WAC] 296-155-176, Lead).

Lead in Painted Surfaces

Interior painted surfaces were tested for lead-based paint (LBP) using bulk sample collection and chemical analysis. A total of ten (10) paint chip samples were collected. Analytical results are provided in Table 3.

Table 3. Summary of Bulk Paint Chip Sample Results.

Sample Number	Location	Component	Substrate	Color	Result (%wt*)
Well House Building 9004					
7198.6-AF-01PB	Room 2	Door jamb	Wood	Gray	0.048
7198.6-AF-02PB	Room 3	Door frame	Wood	Brown	0.25
7198.6-AF-03PB	Exterior	Wall	CMU	Yellow	<0.032
7198.6-AF-04PB	Room 1	Wall/ceiling	Wood	White	<0.019
Building 9508					
7198.6-9508-AF-01PB	Room 1	Wall	CMY	Yellow	<0.015
7198.6-9508-AF-02Pb	Exterior	Soffit	Wood	White	0.28
7198.6-9508-AF-03Pb	Exterior	Wall	CMU	White	0.31
Building 9513					
7198.6-9513-AF-01Pb	Room 1	Wall	Wood	Peach	0.12
7198.6-9513-AF-02Pb	Room 1	Wall	CMU	Yellow	<0.031
7198.6-9513-AF-03Pb	Exterior	Wall	CMU	White	0.17

%wt= percentage weight. **Bolded values** – bulk paint chip samples with lead detected above the laboratory reporting limit have been bolded. The Washington Industrial Safety and Health Administration (WISHA) worker protection regulations have stated that lead at any detectable concentration shall be considered regulated (Washington Administrative Code [WAC] 296-155-176, Lead).

Waste Designation Survey

Well House Building 9004 waste consists of all building components subject to the waste stream, including painted and unpainted wood and CMU. This does not include recyclables (painted or unpainted metal or steel components). There was one (1) TCLP sample collected during this inspection and tested by TCLP analysis for Resource



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

Conservation and Recover Act (RCRA) metal – lead. The results for the sample is listed in Table 4.

1. Sample 7198.6-AF-01TCLP for the Well House Building 9004 was collected of all painted and unpainted building materials suspected to be part of the waste stream.

Table 4. Summary of TCLP Sampling.

Sample	Location and Composition	Result (mg/L)
Well House Building 9004		
7198.6-AF-01TCLP	Representative painted and unpainted materials that will make up the waste stream	<0.40 mg/L

mg/L = milligrams per liter Note: Do not use this table without the complete survey document

Waste stream sampling was not performed at Buildings 9508 and 9513 based on the nature of stored building contents and per request of maintenance personnel.

PCB Light Ballasts and Fluorescent Light Tubes

Older fluorescent light ballasts have small capacitors that may contain high concentrations of polychlorinated biphenyls (PCB). Nearly all ballasts manufactured before 1979 contain PCBs. All ballasts manufactured after July 1, 1978 that do not contain PCBs are required to be clearly marked "No PCBs". Unmarked ballasts or ballasts without a date code should be assumed to be PCB ballasts. PCBs are toxic chemicals according to the EPA. While there is only a small amount, about one ounce, of PCBs in each light ballast capacitor, there are a large number of ballasts in the United States. About half of the one billion ballasts, estimated as currently installed, were manufactured before 1979 and usually contain PCBs. Ballasts manufactured after 1978 may contain a PCB replacement called Di (2-ethylhexyl) phthalate (DEHP), a probable human carcinogen. In any case, ballasts should not be disassembled for disposal but collected and sent to a certified recycling/disposal facility.

Fluorescent light fixtures were observed throughout the building. These fixtures were not inspected for the presence of PCB light ballasts due to being in use and the likelihood that many have been replaced since 1971. Determining how many fluorescent lights actually contain PCB ballasts can only be verified during demolition. Therefore, all light fixtures are assumed to contain PCB light ballasts; light tubes are assumed to contain mercury. Additionally, exit lights, high intensity discharge (HID) lamps, smoke and heat detectors, and fire extinguishers may be regulated as universal or hazardous waste and will require dismantling and special handling. Table 5 provides a summary of these items in the building:

**Table 5. Summary of Fluorescent, HID, and Exit Lights.**

Location/floor	4-foot, 2-bulb	4-foot, 4-bulb
Bldg 9513	6	2
Total	6	2

Typically, there is one ballast for every two light tubes in a fluorescent light fixture; accordingly, there are approximately 10 ballasts in the light fixtures requiring recycling or PCB hazardous waste disposal in Building 9513. There are also approximately 20 four-foot light tubes that will need to be recycled during demolition.

Mercury Containing Switches

Due to the nature of stored materials and lack of accessibility throughout Building 9513, heating system thermostats with potential for mercury-containing systems were not observed at the time of the survey. Confirmation of mercury containing switches will need to be conducted prior to demolition.

Laboratory Analytical Methods

Asbestos-Containing Materials

Bulk samples were analyzed by Polarized Light Microscopy (PLM) dispersion staining EPA Method 600/R-93/116 by Seattle Asbestos Test, LLC. Seattle Asbestos Test, LLC are accredited through the National Voluntary Laboratory Accreditation Program (NVLAP) of the U. S. Department of Commerce. This accreditation does not constitute endorsement, but rather a finding of laboratory competence. Seattle Asbestos Test, LLC participant number is 200768-0 (certification in **Appendix E**). Copies of the laboratory analytical reports are provided in **Appendix F**.

Lead-Based Paint

Bulk paint chip samples were submitted to EMSL Analytical, Inc., for analysis. A total of ten (10) paint chip samples were analyzed for lead using atomic absorption spectroscopy (AAS) to determine the presence and percentage of lead. Procedures for analyzing metals are found in the American Society of Testing and Materials (ASTM) D-3335-78 and EPA Method Manual SW-846, Method 6010. (EMSL used SW 846 3050B*/7000B).



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

One TCLP sample was collected and submitted to EMSL Analytical, Inc. The extraction of the TCLP sample was performed using EPA Method 1311. The lead analysis was performed using EPA Method 6010.

Analytical results for paint chip and TCLP results are provided in **Appendix G**. EMSL Analytical, Inc., laboratory certifications are attached in **Appendix H**.



Comments and Recommendations

Asbestos-Containing Materials

Med-Tox Northwest recommends that this survey report be placed on-site during renovation and/or demolition and copies provided to the contractor(s) bidding and performing work. WISHA, OSHA and PSCAA require that the report be on-site and available for review during the entire project duration.

Additional destructive investigation and sampling will be required prior to and during demolition activities including the following:

1. Med-Tox Northwest assumed all doors as asbestos-containing. Prior to demolition, drill into every door and door frame in the building to determine if suspect fire protection is located inside. Include door jambs in inspection process.
2. Prior to demolition, perform inspection of CMU walls for vermiculite and/or other suspect asbestos materials at Building 9508 and Building 9513. This will require destructive investigation.

Med-Tox Northwest recommends requesting unit pricing from abatement contractors during the bidding process to adjust pricing depending on actual quantities verified in the field.

Lead-Based Paint

With respect to painted surfaces and demolition, OSHA regulates lead at any measurable level and therefore, any paint disturbing activity is subject to compliance with 29 CFR 1926.62. Based on the survey results, two out of four painted surfaces at the Well House Building 9004, two out of three painted surfaces at Building 9508, and two out of three painted surfaces at Building 9513 contain lead, and it is assumed that all painted surfaces contain at least trace levels of lead in paint. As such, the performance of any activities that will disturb painted surfaces is required to be done so in compliance with 29 CFR 1926.62. This requirement will apply to all construction trades, unless painted surfaces are removed during demolition activities, which is typically cost prohibitive. The above-stated regulations pertain specifically to employee exposure during any maintenance, renovation, demolition, decorating, or new construction project where lead is present.



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

The waste stream for Well House Building 9004 was determined to be less than the level of detection of the analytical method. The waste from this project can be disposed of as general construction debris.

Waste designation of demolition debris will be required prior to demolition for Buildings 9508 and 9513 since destructive sampling methods were not allowed. Radioactive materials were stored in these buildings and therefore, the buildings are demarcated as such.

PCB

During demolition, the asbestos abatement contractor should be tasked with dismantling light fixtures, checking for PCB-free labels, and recycling the light tubes in Building 9513. Ballasts without PCB-free labels are considered PCB-containing and must be disposed as a hazardous waste; all other light ballasts can be recycled. Additionally, light tubes can be recycled as a universal waste for minimal cost.



Limitations

A good faith effort has been made to identify ACM, LBP, and other HBM in the Well House Building 9004, Building 9508, and Building 9513. This survey was performed for demolition purposes.

Sampling was performed consistent with the level of care and skill ordinarily exercised by professionals currently practicing under similar conditions in the area. No other warranty, expressed or implied, is made.

This report has been prepared for the exclusive use of Tetra Tech, Inc. and its' designates for this project only. The analyses, conclusions, and recommendations presented in this report are based on conditions encountered at the time of our study and our experience and judgment. Med-Tox Northwest cannot be held responsible for interpretation by others of the data contained in this report; any use of this report shall include the entire document. This survey is not intended for use as abatement plans and/or specifications.



Appendix A

AHERA Building Inspector and Lead-Based Paint Certificates

STATE OF WASHINGTON

Department of Community, Trade and Economic Development
Lead-Based Paint Program

Anthony Fullerton

*Has fulfilled the certification requirements of Washington Administrative
code (WAC) 365-230 and has been certified to conduct lead-based paint
activities pursuant to WAC 365-230-200 as a:*

Risk Assessor

Certification #	Issuance Date	Expiration Date
0242	5/16/2008	4/3/2011

Certificate of Completion

This is to certify that
Ingrid M. Holznagel

has satisfactorily completed
24 hours of training as an

Asbestos Building Inspector

to comply with the training requirements of
TSCA Title III / 40 CFR 763 (AHERA)

Certificate Number: 104187



Instructor

EPA Provider Cert. Number: 1085



Aug 31 - Sep 2, 2009

Date(s) of Training

Exam Score: 96%

Expiration Date: Sep 2, 2010

Argus Pacific, Inc. • 1900 W. Nickerson, Suite 315 • Seattle, Washington • 98119 • (206) 285.3373 • fax (206) 285.3927

Certificate of Completion

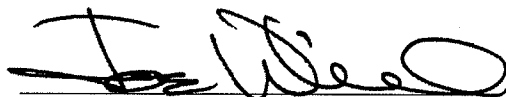
This is to certify that

Anthony L. Fullerton

has satisfactorily completed
4 hours of refresher training as an
Asbestos Building Inspector

to comply with the training requirements of
TSCA Title II / 40 CFR 763 (AHERA)

Certificate Number: 106107



Instructor

EPA Provider Cert. Number: 1085



Feb 17, 2010

Date(s) of Training

Exam Score: NA

Expiration Date: Feb 17, 2011

Argus Pacific, Inc. • 1900 W. Nickerson, Suite 315 • Seattle, Washington • 98119 • (206) 285.3373 • fax (206) 285.3927



Appendix B

Building and Asbestos Materials

Photographic Documentation

Hazardous Building Materials Survey
Well House Bldg 9004
Joint Base Lewis McChord
January 31, 2011



Photo 1: East side of Bldg 9004 Well House. Exterior has non-ACM CMU coating and non-ACM CMU grout.



Photo 2: West side of Bldg 9004 Well House.

Hazardous Building Materials Survey
Well House Bldg 9004
Joint Base Lewis McChord
January 31, 2011



Photo 3: North side of Bldg 9004 Well House. Gaskets on Well House pipes are assumed asbestos-containing.



Photo 4: Interior of room 1, Bldg 9004 Well House. Showing unpainted CMU walls and wood ceiling panels.

Hazardous Building Materials Survey
Well House Bldg 9004
Joint Base Lewis McChord
January 31, 2011



Photo 5: Interior of room 1, Bldg 9004 Well House with asbestos-containing gasket on Well House piping. Additional gaskets are assumed asbestos-containing.



Photo 6: Interior of room 1, Bldg 9004 Well House, with asbestos-containing gray door and wall seam caulk.

Hazardous Building Materials Survey
Well House Bldg 9004
Joint Base Lewis McChord
January 31, 2011



Photo 7: Bldg 9004 Well House-closer view of ACM gray door caulk on exterior doors.



Photo 8: Bldg 9004 Well House with non ACM built-up roofing. No visible sealants on roof.



Appendix C

Summary of Materials Sampled for Asbestos

Summary of Materials Sampled For Asbestos

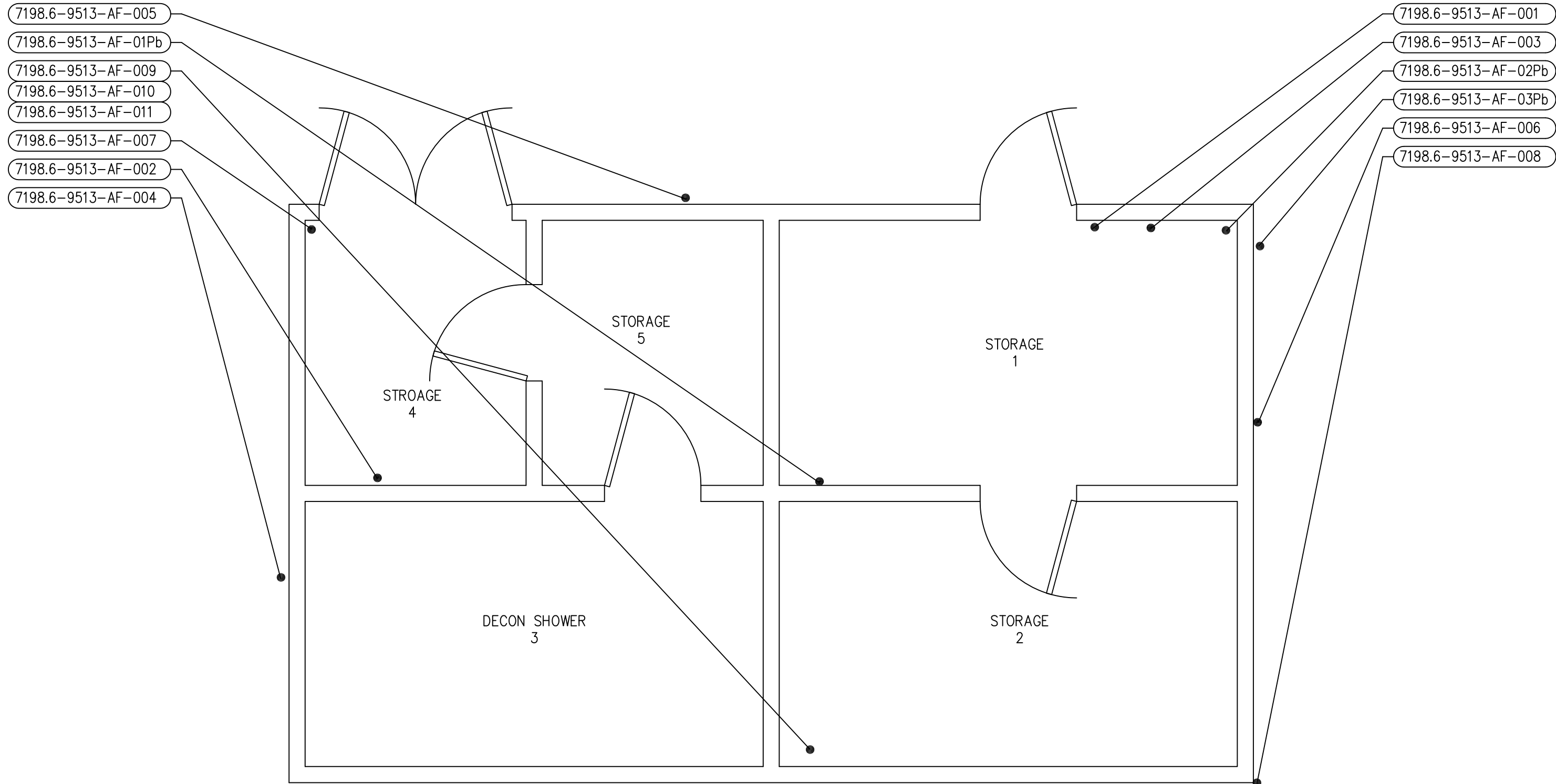
Sample	Material	Location	AHERA Type	HM	Result
WELLHOUSE BLDG 9004					
7198.6-AF-001	CMU coating	Exterior, south wall	Surfacing	1	ND
7198.6-AF-002	CMU coating	Exterior, west wall	Surfacing	1	ND
7198.6-AF-003	CMU coating	Exterior, north wall	Surfacing	1	ND
7198.6-AF-004	CMU grout	Exterior, SW corner of wall	Miscellaneous	2	ND
7198.6-AF-005	CMU grout	Exterior, SE corner of wall	Miscellaneous	2	ND
7198.6-AF-006	Expansion joint compound	Room 1	Miscellaneous	3	ND
7198.6-AF-007	Expansion joint compound	Room 1	Miscellaneous	3	ND
7198.6-AF-008	Built-up roofing	Roof	Miscellaneous	4	ND
7198.6-AF-009	Door frame caulk	Room 3	Miscellaneous	5	3% Chrysotile
7198.6-AF-010	Door frame caulk	Room 2	Miscellaneous	5	3% Chrysotile
7198.6-AF-011	Black sealant on insulation	Room 1	Miscellaneous	6	ND
7198.6-AF-012	Gasket	Well pipe room 1	Miscellaneous	7	22% Chrysotile
BLDG 9508					
7198.6-9508-AF-001	CMU coating	Exterior, SW corner of wall	Surfacing	1	ND
7198.6-9508-AF-002	CMU coating	Exterior, west wall	Surfacing	1	ND
7198.6-9508-AF-003	CMU coating	Exterior, east wall	Surfacing	1	ND
7198.6-9508-AF-004	CMU grout	Exterior, NW corner of wall	Miscellaneous	2	ND
7198.6-9508-AF-005	CMU grout	Exterior, SE corner of wall	Miscellaneous	2	ND
BLDG 9513					
7198.6-9513-AF-001	Yellow floor coating	Room 1	Surfacing	1	ND
7198.6-9513-AF-002	Yellow floor coating	Room 4	Surfacing	1	ND
7198.6-9513-AF-003	Yellow floor coating	Room 1	Surfacing	1	ND
7198.6-9513-AF-004	CMU coating	Exterior, west wall	Surfacing	2	ND
7198.6-9513-AF-005	CMU coating	Exterior, north wall	Surfacing	2	ND
7198.6-9513-AF-006	CMU coating	Exterior, east wall	Surfacing	2	ND
7198.6-9513-AF-007	CMU grout	Exterior, NW corner of wall	Miscellaneous	3	ND
7198.6-9513-AF-008	CMU grout	Exterior, SE corner of wall	Miscellaneous	3	ND
7198.6-9513-AF-009	Pipe fitting insulation	Room 2	TSI	4	4% Chrysotile
7198.6-9513-AF-010	Pipe fitting insulation	Room 2	TSI	4	5% Chrysotile 3% Amosite
7198.6-9513-AF-011	Pipe fitting insulation	Room 2	TSI	4	7% Chrysotile

CMU= cement masonry unit, GWB= gypsum wallboard, HM= homogeneous material, ND= none detected



Appendix D

Sample Location Drawings



BUILDING 9513
SAMPLE LOCATIONS
SCALE: N.T.S.

Symbol										Description	Date	Approved

SAFE ENVIRONMENT OF AMERICA, INC. (SEA)

MED-TOX

NORTHWEST

OCCUPATIONAL ENVIRONMENTAL HEALTH SERVICES
1701 WEST VALLEY HIGHWAY N., SUITE #1
GASTON, SC 29044
(253) 351-0677

ANTHONY FULLERTON

Dwn by: JAL

Chk by: AF

Plot Date:

Plot Scale: AS NOTED

Drawing Number:

1/27/2011

File Name: A.7198.6

PROJECT NUMBER: A.7198.6

PROJECT: BUILDING 9513
CLIENT: TETRA TECH INC.

Sheet reference number

Sheet 1 OF 1

7198.6-9508-AF-03Pb

7198.6-9508-AF-003

7198.6-9508-AF-001

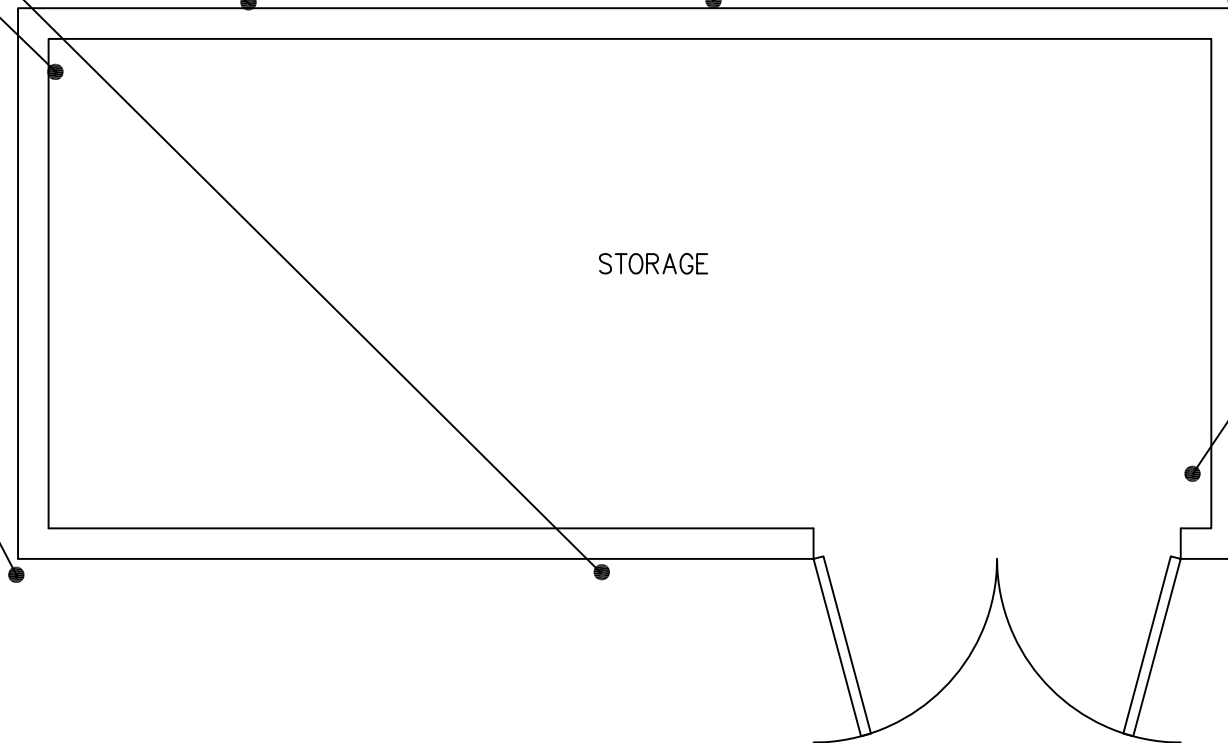
7198.6-9508-AF-005

7198.6-9508-AF-002

7198.6-9508-AF-004

7198.6-9508-AF-02Pb

7198.6-9508-AF-01Pb



STORAGE



BUILDING 9508
SAMPLE LOCATIONS
SCALE: N.T.S.

[illegible]

ANTHONY FULLERTON	1/27/2011
Dwn by: JAL	File Name: A.7198.6
Chk by: AF	
Plot Date:	
Plot Scale: AS NOTED	
Drawing Number:	

MED-TOX
SAFE ENVIRONMENT OF AMERICA, INC. #83
NORTHWEST
OCCUPATIONAL ENVIRONMENTAL HEALTH SERVICES
<http://www.medtoxamer.com>
1701 WEST VALLEY HIGHWAY N., SUITE #1
AURUM, WASHINGTON 98003
(253) 351-0658 (FAX)
(253) 351-0077

PROJECT NUMBER: A.7198.6

PROJECT: BUILDING 9508
CLIENT: TETRA TECH INC.

Sheet
reference
numberSheet 1 OF 1



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

Appendix E

National Voluntary Laboratory Accreditation Program Certificate

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200768-0

Seattle Asbestos Test, LLC
Lynnwood, WA

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

BULK ASBESTOS FIBER ANALYSIS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2010-10-01 through 2011-09-30

Effective dates



Sally S. Bruce
For the National Institute of Standards and Technology



Hazardous Building Materials Survey — Buildings 9004, 9508, 9513

Appendix F

Analytical Report- Asbestos

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited, 200768-0

CHAIN OF CUSTODYClient Name Med-Tox NorthwestAddress 1701 W. Valley Hwy N. # 3 City Auburn ST WA ZIP 98001Phone: 253 351-0688Fax: 253 351-0688Email: Fullerton@MedtoxNW.coProject Location: BLDG 9513Project Manager: Anthony FullertonTurn Around Time Std. Number of Samples 11Client Job # A-7198.6

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LAB ID	A/R
1	7198.6-9513-AF-001	Yellow floor coating RM 1		
2	7198.6-9513-AF-002	Yellow floor coating RM 4		
3	7198.6-9513-AF-003	Yellow floor coating RM 1		
4	7198.6-9513-AF-004	Ext. CMU coating-W.		
5	7198.6-9513-AF-005	Ext. CMU coating-N.		
6	7198.6-9513-AF-006	Ext CMU coating-E.		
7	7198.6-9513-AF-007	Ext. CMU grout-NW corner		
8	7198.6-9513-AF-008	EXT. CMU grout-SE corner		
9	7198.6-9513-AF-009	Pipe fitting insulation-RM 2		
10	7198.6-9513-AF-010	Pipe fitting insulation-RM 2		
11	7198.6-9513-AF-011	Pipe fitting insulation-RM 2		
12				
13				
14				
15				
16				
17				
18				
19				
20				

	Print Name	Signature	Company Name	Date	Time
Sampled	Anthony Fullerton				
Relinquished	Ingrid Holzner		Med Tox NW	1/16/11	
Delivered					
Received	Lorie Watten		SAT	1/17/11	4:22pm
Analyzed	H. Mummey		SAT	1/14/11	1:30
Reported					

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results.

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited - Bellevue:200876; Lynnwood:200768

Lynnwood Laboratory: 19711 Scriber Lake Rd, Suite D, Lynnwood, WA 98036; Tel: 425.673.9850, Fax:425.673.9810

Bellevue Laboratory: 12727 Northup Way, Suite 1, Bellevue, WA 98005; Tel: 425.861.1111, Fax: 425.861.1118

Website: <http://www.seattleasbestostest.com>, E-mail: admin@seattleasbestostest.com**ANALYTICAL LABORATORY REPORT**

PLM by Method EPA/600/R-93/116

Attn.: Mr. Anthony Fullerton
 Client: Med-Tox, Northwest
 Address: PO Box 1446
 Auburn, WA 98071-1446

Client Job #: A-7198.6
 Laboratory Batch #: 201109038
 Date Received: 1/11/2011
 Samples Received: 11
 Date Analyzed: 1/14/2011
 Samples Analyzed: 11

Project: Bldg. 9513

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-Fibrous Components	%	Non-asbestos Fibers
1	7198.6-9513-AF-001	1	Yellow vinyl		None detected	Vinyl/binder		None detected
		2	Gray fibrous material with mastic		None detected	Binder/filler, Mastic/binder	67	Cellulose
2	7198.6-9513-AF-002	1	Yellow vinyl with paint		None detected	Vinyl/binder, Paint	3	Cellulose
3	7198.6-9513-AF-003	1	Yellow vinyl		None detected	Vinyl/binder		None detected
		2	Gray fibrous material with mastic		None detected	Binder/filler, Mastic/binder	69	Cellulose
4	7198.6-9513-AF-004	1	White sandy/brittle material with paint		None detected	Filler, Binder, Paint, Sand	2	Cellulose
5	7198.6-9513-AF-005	1	White sandy/brittle material with paint		None detected	Filler, Binder, Paint, Sand	2	Cellulose
6	7198.6-9513-AF-006	1	White brittle material with paint		None detected	Filler, Binder, Paint	5	Cellulose
		2	Gray sandy/brittle material with paint		None detected	Filler, Binder, Paint, Sand	3	Cellulose
7	7198.6-9513-AF-007	1	White brittle material with paint		None detected	Filler, Binder, Paint	4	Cellulose
		2	Gray sandy/brittle material with paint		None detected	Filler, Binder, Paint, Sand	2	Cellulose
8	7198.6-9513-AF-008	1	White brittle material with paint		None detected	Filler, Binder, Paint	3	Cellulose
		2	Gray sandy/brittle material with paint		None detected	Filler, Binder, Paint, Sand	2	Cellulose
9	7198.6-9513-AF-009	1	White woven fibrous material with powdery material with paint	4	Chrysotile	Binder/filler, Paint, Filler	28	Cellulose
10	7198.6-9513-AF-010	1	White woven fibrous material with powdery material with paint	5	Chrysotile	Binder/filler, Paint, Filler, Glass beads	26	Cellulose, Glass fibers
				3	Amosite			
11	7198.6-9513-AF-011	1	White woven fibrous material with powdery material with paint	7	Chrysotile	Binder/filler, Paint, Filler	30	Cellulose

Tuesday, August 16, 2011


 Analyzed by: Heather Mummev/Weilong Tai

Report reviewed by: Steve (Fanvao) Zhana. President

201109086

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited, 200768-0

CHAIN OF CUSTODYClient Name Med Tox NorthwestAddress 1701 W. Valley Hwy N. # 3 City Auburn ST WA ZIP 98001Phone: 253 351-0688Fax: 253 351-0688Email: Fullerton@MedtoxNW.comProject Location: BLDG. 9508Project Manager: Anthony FullertonTurn Around Time Std Number of Samples 5 Client Job # 7198.6

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LAB ID	A/R
1	7198.6-9508-AF-001	EXT. CMU COATING-SWNER		
2	7198.6-9508-AF-002	EXT. CMU COATING-W.		
3	7198.6-9508-AF-003	EXT. CMU COATING-E.		
4	7198.6-9508-AF-004	EXT. CMU GROUT-NW		
5	7198.6-9508-AF-005	EXT. CMU GROUT-SE		
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

	Print Name	Signature	Company Name	Date	Time
Sampled	Anthony Fullerton				
Relinquished	Ingrid Holzner		Med Tox NW	1/14/11	
Delivered					
Received	Lizette Watten		SAT	1/14/11	4:22pm
Analyzed	H. Mummey		SAT	1/14/11	1240
Reported					

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results.

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited - Bellevue:200876; Lynnwood:200768

Lynnwood Laboratory: 19711 Scriber Lake Rd, Suite D, Lynnwood, WA 98036; Tel: 425.673.9850, Fax:425.673.9810

Bellevue Laboratory: 12727 Northup Way, Suite 1, Bellevue, WA 98005; Tel: 425.861.1111, Fax: 425.861.1118

Website: <http://www.seattleasbestostest.com>, E-mail: admin@seattleasbestostest.com**ANALYTICAL LABORATORY REPORT**

PLM by Method EPA/600/R-93/116

Attn.: Mr. Anthony Fullerton

Client: Med-Tox, Northwest

Address: PO Box 1446

Auburn, WA 98071-1446

Client Job #: 7198.6

Laboratory Batch #: 201109036

Date Received: 1/11/2011

Samples Received: 5

Date Analyzed: 1/14/2011

Samples Analyzed: 5

Project: Bldg. 9508

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-Fibrous Components	%	Non-asbestos Fibers
1	7198.6-9508-AF-001	1	Off-white brittle material with paint		None detected	Filler, Binder, Paint	3	Cellulose
2	7198.6-9508-AF-002	1	Off-white brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
3	7198.6-9508-AF-003	1	Off-white brittle material with paint		None detected	Filler, Binder, Paint	4	Cellulose
4	7198.6-9508-AF-004	1	Gray sandy/brittle material with paint		None detected	Sands, Filler, Paint	2	Cellulose
5	7198.6-9508-AF-005	1	Gray sandy/brittle material with paint		None detected	Sands, Filler, Paint, Mica	3	Cellulose

Analyzed by: Heather Mummey/Weilong Tai

Tuesday, August 16, 2011

Report reviewed by: Steve (Fanvao) Zhana, President

20110803

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited, 200768-0

CHAIN OF CUSTODYClient Name Med-Tox NorthwestAddress 1701 W. Valley Hwy N. # 3 City Auburn ST WA ZIP 98001Phone: 253 351-0677Fax: 253 351-0688Email: Fullerton@MedtoxNW.coProject Location: Bldg 9004 Well HouseProject Manager: Anthony FullertonTurn Around Time Std Number of Samples 12 Client Job # 7198.6

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LAB ID	A/R
1	7198.6-AF-001	EXT CMU Coating - S.		
2	7198.6-AF-002	EXT CMU Coating - W.		
3	7198.6-AF-003	EXT CMU Coating - N.		
4	7198.6-AF-004	EXT CMU grout - SW corner		
5	7198.6-AF-005	EXT CMU grout - SE corner		
6	7198.6-AF-006	Expansion joint compound - RM 1		
7	7198.6-AF-007	Expansion joint compound - RM 2		
8	7198.6-AF-008	Built-up roofing		
9	7198.6-AF-009	Door frame caulk - RM 3		
10	7198.6-AF-010	Door frame caulk - RM 2		
11	7198.6-AF-011	Black Sealant on insulation RM 1		
12	7198.6-AF-012	Gasket		
13				
14				
15				
16				
17				
18				
19				
20				

	Print Name	Signature	Company Name	Date	Time
Sampled	Anthony Fullerton				
Relinquished	Ingrid Holzner	<i>I. Holzner</i>	Med-Tox NW	1/14/11	
Delivered					
Received	Lizette Watten	<i>Lizette Watten</i>	SAT	1/14/11	4:22pm
Analyzed	H. Mummey	<i>H. Mummey</i>	SAT	1/14/11	12:20
Reported					

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warranties, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results.

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited - Bellevue:200876; Lynnwood:200768

Lynnwood Laboratory: 19711 Scriber Lake Rd, Suite D, Lynnwood, WA 98036; Tel: 425.673.9850, Fax:425.673.9810

Bellevue Laboratory: 12727 Northup Way, Suite 1, Bellevue, WA 98005; Tel: 425.861.1111, Fax: 425.861.1118

Website: <http://www.seattleasbestostest.com>, E-mail: admin@seattleasbestostest.com**ANALYTICAL LABORATORY REPORT**

PLM by Method EPA/600/R-93/116

Attn.: Mr. Anthony Fullerton

Client: Med-Tox, Northwest

Address: PO Box 1446

Auburn, WA 98071-1446

Client Job #: 7198.6

Laboratory Batch #: 201109037

Date Received: 1/11/2011

Samples Received: 12

Date Analyzed: 1/14/2011

Samples Analyzed: 12

Project: Bldg. 9004 Well House

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-Fibrous Components	%	Non-asbestos Fibers
1	7186-AF-001	1	Tan brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		2	Trace gray sandy/brittle material		None detected	Sands, Filler	3	Cellulose
2	7186-AF-002	1	Tan brittle material with paint		None detected	Filler, Binder, Paint	3	Cellulose
3	7186-AF-003	1	Tan brittle material with paint		None detected	Filler, Binder, Paint	4	Cellulose
4	7186-AF-004	1	Gray sandy/brittle material		None detected	Sands, Filler	3	Cellulose
5	7186-AF-005	1	Gray soft material		None detected	Binder, Filler	4	Cellulose, Talc
		2	Gray sandy/brittle material		None detected	Sands, Filler	3	Cellulose
6	7186-AF-006	1	Black asphaltic fibrous material		None detected	Filler, Asphalt, Binder	67	Cellulose
7	7186-AF-007	1	Black asphaltic fibrous material		None detected	Filler, Asphalt, Binder	69	Cellulose
8	7186-AF-008	1	Multi-layered black asphaltic material		None detected	Asphalt/binder	5	Cellulose
		2	Black asphaltic fibrous material		None detected	Asphalt/binder	71	Cellulose
		3	Multi-layered black asphaltic material		None detected	Asphalt/binder	3	Cellulose
9	7186-AF-009	1	Gray soft material	3	Chrysotile	Binder, Filler	6	Cellulose, Talc
10	7186-AF-010	1	Gray soft material	3	Chrysotile	Binder, Filler	4	Cellulose, Talc
11	7186-AF-011	1	Silver foil		None detected	Foil/binder		None detected
		2	Tan paper with black mastic		None detected	Filler, Asphalt/binder	70	Cellulose
		3	Trace yellow fibrous material		None detected	Filler, Glass beads	89	Glass fibers
12	7186-AF-012	1	Black rubbery material with paint	22	Chrysotile	Rubber/binder, Paint	2	Cellulose

Analyzed by: Heather Mummey/Weilong Tai

Tuesday, August 16, 2011

Report reviewed by: Steve (Fanyao) Zhana, President



Appendix G

Analytical Report- Lead

**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

Phone: (317) 803-2997 Fax: (317) 803-3047 Email: indianapolislabs@emsl.com

Attn: **Anthony Fullerton**
Med-Tox Northwest
PO Box 1446

Auburn, WA 98071

Fax: (253) 351-0688

Phone: (253) 351-0677

Project: **Well House/ 7198.6**

Customer ID: MEDT50

Customer PO: 109614

Received: 01/12/11 10:05 AM


EMSL Order: 161100487

EMSL Proj:

Test Report: Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

<i>Lab ID:</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>	<i>Notes</i>
0001	1/13/2011	0.40 mg/L	<0.40 mg/L	
Client Sample 7198.6-AF-01Pb				Collected: 1/11/2011

Initial report from 01/20/2011 14:57:19


Doug Wiegand, Laboratory Manager
or other approved signatory

This report relates only to those items tested. Samples received in good condition unless otherwise noted. Quality Control Data associated with this sample set is within acceptable limits, unless otherwise noted

Samples analyzed by EMSL Analytical, Inc. 2001 East 52nd St., Indianapolis IN



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Lead & Metals Chain of Custody

EMSL Order Number (Lab Use Only):

1101100487

Indianapolis, IN
2001 East 52nd Street
Indianapolis, IN 46205
PHONE: (317) 803-2997
FAX: (317) 803-3047

Company: Med-Tox Northwest		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 1701 West Valley Hwy North Suite 3		Third Party Billing requires written authorization from third party	
City/State/Zip: Auburn, WA 98001			
Report To (Name): Anthony Fullerton		Fax: 253-351-0688	
Telephone: 253-351-0677		Email Address: fullertona@medtoxnw.com	
Project Name/Number: Well House / 7198.6			
Please Provide Results:		Purchase Order:	
State Samples Taken: WA			
Turnaround Time (TAT) Options* - Please Check			
<input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input type="checkbox"/> 24 Hour <input type="checkbox"/> 48 Hour <input type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input checked="" type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week			
*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide			
Matrix	Method	Instrument	Reporting Limit
Chips <input type="checkbox"/> mg/cm ² <input type="checkbox"/> % by wt.	SW846-7000B/7420 or AOAC 974.02	Flame Atomic Absorption	0.01%
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter
	NIOSH 7300 modified	ICP-AES	0.5 µg/filter
Wipe* <input type="checkbox"/> ASTM <input type="checkbox"/> non ASTM	SW846-7000B/7420	Flame Atomic Absorption	10 µg/wipe
*If no box is checked, non-ASTM Wipe is assumed	SW846-6010B or C	ICP-AES	0.5 µg/wipe
TCLP	SW846-1311/7420/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)
	SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)
Soil	SW846-7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)
	SW846-7421	Graphite Furnace AA	0.3 mg/kg (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Wastewater	SM3111B or SW846-7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Drinking Water	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
Other:		Preservation Method (Water):	
Name of Sampler: Anthony Fullerton		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
7198.6-PF-01 TCLP			
Client Sample #'s	01 TCLP -	Total # of Samples:	1
Relinquished (Client):	Ingrid Holzman	Date:	1/11/11
Received (Lab):	SW	Date:	1-12-11
		Time:	1005
Comments/Special Instructions:			

Controlled Document - Lead & Metals COC - LM-1.0 - 11/23/2009

Page 1 of ___ Pages

Tuesday, August 16, 2011

http://www.emsl.com/COC_Print.cfm

1/11/2011

**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

Phone: (317) 803-2997 Fax: (317) 803-3047 Email: indianapolislaboratory@emsl.com

Attn: **Anthony Fullerton**
Med-Tox Northwest
PO Box 1446

Auburn, WA 98071

Customer ID: MEDT50
Customer PO: 109614
Received: 01/12/11 10:05 AM
EMSL Order: 161100485


Fax: (253) 351-0688 Phone: (253) 351-0677
Project: **House/ 7198.6**

EMSL Proj:

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

Lab ID:	Analyzed	RDL	Lead Concentration	Notes
0001	1/13/2011	0.010 % wt	0.048 % wt	
Client Sample 7198.6-AF-01Pb				Collected: 1/11/2011
0002	1/13/2011	0.010 % wt	0.25 % wt	
Client Sample 7198.6-AF-02Pb				Collected: 1/11/2011
0003	1/13/2011	0.032 % wt	<0.032 % wt	
Client Sample 7198.6-AF-03Pb				Collected: 1/11/2011
0004	1/13/2011	0.019 % wt	<0.019 % wt	
Client Sample 7198.6-AF-04Pb				Collected: 1/11/2011

Initial report from 01/20/2011 15:00:44


Doug Wiegand, Laboratory Manager
or other approved signatory

Reporting limit is 0.01 % wt. The QC data associated with these sample results included in this report meet the method quality control requirements, unless specifically indicated otherwise. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities.

* slight modifications to methods applied Samples received in good condition unless otherwise noted. Quality Control Data associated with this sample set is within acceptable limits, unless otherwise noted

Samples analyzed by EMSL Analytical, Inc. 2001 East 52nd St., Indianapolis IN AIHA-LAP, LLC--ELLAP 157245, OH E10040

EMSL ANALYTICAL, INC.
LABORATORY PRODUCT TRAINING

Lead & Metals Chain of Custody

EMSL Order Number (Lab Use Only):

101100485

 Indianapolis, IN
 2001 East 52nd Street
 Indianapolis, IN 46205
 PHONE: (317) 803-2997
 FAX: (317) 803-3047

Company: Med-Tox Northwest

Street: 1701 West Valley Hwy North Suite 3

City/State/Zip: Auburn, WA 98001

Report To (Name): Anthony Fullerton

Telephone: 253-351-0677

EMSL-Bill to: ☒ Same ☐ Different

If Bill to is Different note instructions in Comments**

Third Party Billing requires written authorization from third party

Fax: 253-351-0688

Email Address: fullertona@medtoxnw.com

Project Name/Number: Well House / 7198.6

Please Provide Results:

Purchase Order:

State Samples Taken: WA

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour☐ 6 Hour☐ 24 Hour☐ 48 Hour☐ 72 Hour☐ 96 Hour☒ 1 Week☐ 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix

Method

Instrument

Reporting Limit

Check

Chips

☐ mg/cm²☒ % by wt.SW846-7000B/7420
or AOAC 974.02

Flame Atomic Absorption

0.01%

☒

Air

NIOSH 7082

Flame Atomic Absorption

4 µg/filter

☐

NIOSH 7105

Graphite Furnace AA

0.03 µg/filter

☐

NIOSH 7300 modified

ICP-AES

0.5 µg/filter

☐

Wipe*

☐ ASTM☐ non ASTM

*If no box is checked, non-ASTM Wipe is assumed

SW846-7000B/7420

Flame Atomic Absorption

10 µg/wipe

☐

SW846-6010B or C

ICP-AES

0.5 µg/wipe

☐

TCLP

SW846-1311/7420/SM 3111B

Flame Atomic Absorption

0.4 mg/L (ppm)

☐

SW846-6010B or C

ICP-AES

0.1 mg/L (ppm)

☐

Soil

SW846-7000B/7420

Flame Atomic Absorption

40 mg/kg (ppm)

☐

SW846-7421

Graphite Furnace AA

0.3 mg/kg (ppm)

☐

SW846-6010B or C

ICP-AES

1 mg/kg (ppm)

☐

Wastewater

SM3111B or

SW846-7000B/7420

Flame Atomic Absorption

0.4 mg/L (ppm)

☐

EPA 200.9

Graphite Furnace AA

0.003 mg/L (ppm)

☐

SW846-6010B or C

ICP-AES

1 mg/kg (ppm)

☐

Drinking Water

EPA 200.9

Graphite Furnace AA

0.003 mg/L (ppm)

☐

Other:

Preservation Method (Water):

Name of Sampler: Anthony Fullerton

Signature of Sampler:

Sample #

Location

Volume/Area

Date/Time Sampled

 7198.6-AF-01Pb Gray on wood door jamb
 7198.6-AF-02Pb Brown on wood door frame
 7198.6-AF-03Pb (Ext) yellow on CMU wall
 7198.6-AF-04Pb White on wood wall/ceiling

Client Sample #'s

01Pb - 04Pb

Total # of Samples:

4

Relinquished (Client):

Date:

1/11/11

Time:

Received (Lab):

Date:

1-12-11

Time:

1005g/l

Comments/Special Instructions:

**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

Phone: (317) 803-2997 Fax: (317) 803-3047 Email: indianapolislabs@emsl.com

Attn: **Anthony Fullerton**
Med-Tox Northwest
PO Box 1446

Auburn, WA 98071

Fax: (253) 351-0688

Phone: (253) 351-0677

Project: **BLDG 9508/7198.6**

Customer ID: MEDT50

Customer PO: 180932

Received: 01/12/11 10:05 AM


EMSL Order: 161100484

EMSL Proj:

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Lab ID:</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>	<i>Notes</i>
0001	1/13/2011	0.015 % wt	<0.015 % wt	
Client Sample 7198.6-9508-AF-01Pb				Collected: 1/11/2011
0002	1/13/2011	0.033 % wt	0.28 % wt	
Client Sample 7198.6-9508-AF-02Pb				Collected: 1/11/2011
0003	1/13/2011	0.010 % wt	0.31 % wt	
Client Sample 7198.6-9508-AF-03Pb				Collected: 1/11/2011

Initial report from 01/20/2011 14:59:11


Doug Wiegand, Laboratory Manager
or other approved signatory

Reporting limit is 0.01 % wt. The QC data associated with these sample results included in this report meet the method quality control requirements, unless specifically indicated otherwise. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities.

* slight modifications to methods applied Samples received in good condition unless otherwise noted. Quality Control Data associated with this sample set is within acceptable limits, unless otherwise noted

Samples analyzed by EMSL Analytical, Inc. 2001 East 52nd St., Indianapolis IN AIHA-LAP, LLC--ELLAP 157245, OH E10040



Lead & Metals Chain of Custody

EMSL Order Number (Lab Use Only):

101100484

Indianapolis, IN
2001 East 52nd Street
Indianapolis, IN 46205
PHONE: (317) 803-2997
FAX: (317) 803-3047

Company: Med-Tox Northwest		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different	
Street: 1701 West Valley Hwy North Suite 3		If Bill to is Different note instructions in Comments**	
City/State/Zip: Auburn, WA 98001		Third Party Billing requires written authorization from third party	
Report To (Name): Anthony Fullerton		Fax: 253-351-0688	
Telephone: 253-351-0677		Email Address: fullertona@medtoxnw.com	
Project Name/Number: BLDG 9508 / 7198.6			
Please Provide Results:		Purchase Order:	
State Samples Taken: WA			
Turnaround Time (TAT) Options* - Please Check			
<input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input type="checkbox"/> 24 Hour <input type="checkbox"/> 48 Hour <input type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input checked="" type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week			
*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide			
Matrix	Method	Instrument	Reporting Limit
Chips <input type="checkbox"/> mg/cm ² <input checked="" type="checkbox"/> % by wt.	SW846-7000B/7420 or AOAC 974.02	Flame Atomic Absorption	0.01%
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter
	NIOSH 7300 modified	ICP-AES	0.5 µg/filter
Wipe* <input type="checkbox"/> ASTM <input type="checkbox"/> non ASTM	SW846-7000B/7420	Flame Atomic Absorption	10 µg/wipe
*If no box is checked, non-ASTM Wipe is assumed	SW846-6010B or C	ICP-AES	0.5 µg/wipe
TCLP	SW846-1311/7420/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)
	SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)
Soil	SW846-7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)
	SW846-7421	Graphite Furnace AA	0.3 mg/kg (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Wastewater	SM3111B or SW846-7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Drinking Water	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
Other:		Preservation Method (Water):	
Name of Sampler: Anthony Fullerton		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
7198.6-9508-AF-01Pb	Yellow on cnu wall		
7198.6-9508-AF-02Pb	White on woodsoffit (Ext.)		
7198.6-9508-AF-03Pb	(Ext.) White on cnu		
Client Sample #'s: 01Pb - 03Pb		Total # of Samples: 3	
Relinquished (Client):	Date: 1/11/11	Time:	
Received (Lab):	Date: 1-12-11	Time:	1005g
Comments/Special Instructions:			

Controlled Document - Lead & Metals COC - LM-1.0 - 11/23/2009

Page 1 of ___ Pages

Tuesday, August 16, 2011

http://www.emsl.com/COC_Print.cfm

1/11/2011

**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

Phone: (317) 803-2997 Fax: (317) 803-3047 Email: indianapolislabs@emsl.com

Attn: **Anthony Fullerton**
Med-Tox Northwest
PO Box 1446

Auburn, WA 98071

Fax: (253) 351-0688

Phone: (253) 351-0677

Project: **Bldg 9513/ 7198.6**

Customer ID: MEDT50

Customer PO: 109614

Received: 01/12/11 10:05 AM


EMSL Order: 161100482

EMSL Proj:

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Lab ID:</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>	<i>Notes</i>
0001	1/13/2011	0.035 % wt	0.12 % wt	
Client Sample 7198.6-9513-AF-01PB				Collected: 1/11/2011
0002	1/13/2011	0.031 % wt	<0.031 % wt	
Client Sample 7198.6-9513-AF-02Pb				Collected: 1/11/2011
0003	1/13/2011	0.012 % wt	0.17 % wt	
Client Sample 7198.6-9513-AF-03Pb				Collected: 1/11/2011

Initial report from 01/24/2011 17:21:20


Doug Wiegand, Laboratory Manager
or other approved signatory

Reporting limit is 0.01 % wt. The QC data associated with these sample results included in this report meet the method quality control requirements, unless specifically indicated otherwise. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities.

* slight modifications to methods applied Samples received in good condition unless otherwise noted. Quality Control Data associated with this sample set is within acceptable limits, unless otherwise noted

Samples analyzed by EMSL Analytical, Inc. 2001 East 52nd St., Indianapolis IN AIHA-LAP, LLC--ELLAP 157245, OH E10040



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS - TRAINING

Lead & Metals Chain of Custody

EMSL Order Number(Lab Use Only):

161100482

Indianapolis, IN
2001 East 52nd Street
Indianapolis, IN 46205
PHONE: (317) 803-2997
FAX: (317) 803-3047

Company: Med-Tox Northwest		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different	
Street: 1701 West Valley Hwy North Suite 3		If Bill to is Different note instructions in Comments**	
City/State/Zip: Auburn, WA 98001		Third Party Billing requires written authorization from third party	
Report To (Name): Anthony Fullerton		Fax: 253-351-0688	
Telephone: 253-351-0677		Email Address: fullertona@medtoxnw.com	
Project Name/Number: Bldg 9513 7198.16			
Please Provide Results:		Purchase Order:	
State Samples Taken: WA			
Turnaround Time (TAT) Options* - Please Check			
<input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input type="checkbox"/> 24 Hour <input type="checkbox"/> 48 Hour <input type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input checked="" type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week			
*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide.			
Matrix	Method	Instrument	Reporting Limit
Chips <input type="checkbox"/> mg/cm ² <input checked="" type="checkbox"/> % by wt.	SW846-7000B/7420 or AOAC 974.02	Flame Atomic Absorption	0.01%
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter
	NIOSH 7300 modified	ICP-AES	0.5 µg/filter
Wipe* <input type="checkbox"/> ASTM <input type="checkbox"/> non ASTM	SW846-7000B/7420	Flame Atomic Absorption	10 µg/wipe
*If no box is checked, non-ASTM Wipe is assumed	SW846-6010B or C	ICP-AES	0.5 µg/wipe
TCLP	SW846-1311/7420/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)
	SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)
Soil	SW846-7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)
	SW846-7421	Graphite Furnace AA	0.3 mg/kg (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Wastewater	SM3111B or SW846-7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)
Drinking Water	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
Other:		Preservation Method (Water):	
Name of Sampler: Anthony Fullerton		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
7198.16-9513-AF-01Pb	Peach on wood wall		
7198.16-9513-AF-02Pb	Yellow on cnu wall		
7198.16-9513-AF-03Pb	(Ext) White on cnu wall		
Client Sample #'s 01Pb - 03Pb		Total # of Samples: 3	
Relinquished (Client):	Innards Volzgral	Date: 1/11/11	Time:
Received (Lab):	SSJ	Date: 1-12-11	Time: 1005
Comments/Special Instructions:			

Controlled Document - Lead & Metals COC - LM-1.0 - 11/23/2009

Page 1 of ___ Pages

Tuesday, August 16, 2011

http://www.emsl.com/COC_Print.cfm

1/11/2011



Appendix H

EMSL Laboratories, Inc. Laboratory Certifications



December 22, 2010

Lab ID#: 157245

Richard Harding
EMSL Analytical, Inc.
2001 East 52nd St
Indianapolis, IN 46205

Dear Mr. Harding:

AIHA Laboratory Accreditation Programs, (AIHA-LAP, LLC) has approved an extension to your laboratory's current certificate of accreditation in the Industrial Hygiene Laboratory Accreditation Program (IHLAP), Environmental Lead Laboratory Accreditation Program (ELLAP) and Environmental Microbiological Laboratory Accreditation Program (EMLAP). This extension will expire on February 01, 2011. Remember that your laboratory's proficiency rating in the PAT programs must be maintained for the new certificate to be issued.

Your laboratory remains an accredited laboratory in the IHLAP, ELLAP and EMLAP programs. Please keep a copy of this letter with your expired certificate. If you have questions or concerns, please feel free to contact Olena Bulgakova, Laboratory Accreditation Specialist at (703) 846-0792.

Sincerely,

A handwritten signature in cursive script that reads "Cheryl O. Morton".

Cheryl O. Morton
Director, Affiliate Laboratory Programs



The American Industrial Hygiene Association

acknowledges that

EMSL Analytical, Inc.

2001 East 52nd Street, Indianapolis, IN 46205

Laboratory ID: 157245

has fulfilled the requirements of the AIHA Laboratory Quality Assurance Programs (LQAP), thereby, conforming to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories*. The above named laboratory, along with all premises from which key activities are performed, as listed above, have been accredited by AIHA in the following:

ACCREDITATION PROGRAMS

- | | |
|--|-----------------------------------|
| <input checked="" type="checkbox"/> INDUSTRIAL HYGIENE | Accreditation Expires: 06/01/2010 |
| <input checked="" type="checkbox"/> ENVIRONMENTAL LEAD | Accreditation Expires: 06/01/2010 |
| <input checked="" type="checkbox"/> ENVIRONMENTAL MICROBIOLOGY | Accreditation Expires: 06/01/2010 |
| <input type="checkbox"/> FOOD | Accreditation Expires: |

Specific Field(s) of Testing (FoTy) Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with LQAP requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA website for the most current status of the scope of accreditation.

Laura R. McMahon

Laura R. McMahon
Chairperson, Analytical Accreditation Board

Lindsay E. Bocher

Lindsay E. Bocher, CH, CSP
President, AIHA

Date Issued: 06/30/2008


**LABORATORY QUALITY
ASSURANCE PROGRAMS**
ROUND DATA
AIHA
*Your Essential Connection: Advancing Occupational
and Environmental Health and Safety Globally*

 2700 Prosperity Ave., Suite 250, Fairfax, VA 22031 U.S.A.
 (703) 849-8888; Fax (703) 207-3561; www.aiha.org

AIHA Laboratory Quality Assurance Programs

SCOPE OF ACCREDITATION

EMSL Analytical, Inc.

 2001 East 52nd Street, Indianapolis, IN 46205

 Laboratory ID: **157245**

Issue Date: 06/30/2005

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or revocation. A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA website at: <http://www.aiha.org/LaboratoryServices/html/lists.htm>

The EPA recognizes the AIHA ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil, and dust wipe analysis. Air analysis is not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 09/01/2002

Field of Testing (FoT)	Method	Method Description (for internal methods only)
Airborne Dust	NIOSH 7082	
Paint Chips	EPA SW-846 3050B	
	EPA SW-846 7420	
Settled Dust by Wipe	EPA SW-846 3050B	
	EPA SW-846 7420	
Soil	EPA SW-846 3050B	
	EPA SW-846 7420	

The laboratory participates in the following AIHA testing programs:

- ✓ Paint
- ✓ Soil
- ✓ Airborne Dust
- ✓ Settled Dust by Wipe

Effective: April 11, 2005

157245_Scope_ELLAP_2008_06_30

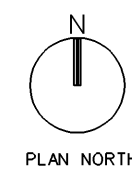
Author: Kris Heinbaugh

Page 1 of 1

APPENDIX DD – Typical RSU Building Design

The following drawings are for an RSU for another project. The requirements for this project will be similar.

[illegible]



FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING

FLOOR PLAN

FT. LEWIS PN 53636 WASHINGTON

Plate number: **A-101**

Sheet of -

VOLUME 6

FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING

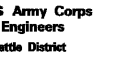
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FT. LEWIS PN 53636 WASHINGTON

Plate number: **A-101**

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	Checked by:	Rev.	
Prepared by:			

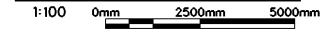
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JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING

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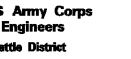


SCREEN WALL NOT SHOWN FOR CLARITY.
SEE ELEVATION BELOW.



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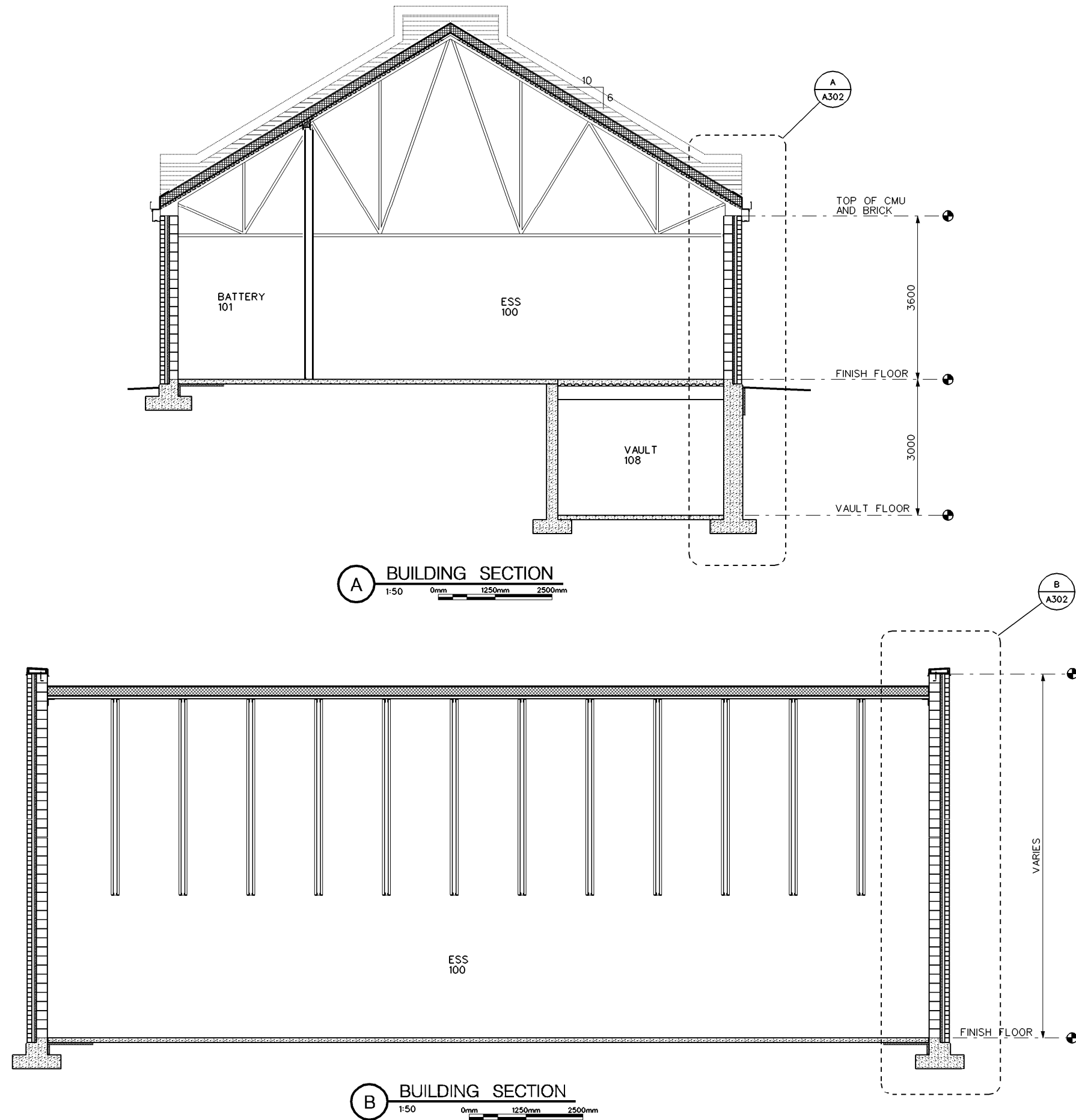
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FT. LEWIS PN 53636 WASHINGTON
 BUILDING SECTIONS
 REMOTE SWITCH UNIT BUILDING
 JACKSON AVENUE

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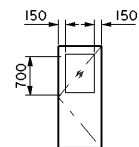
DOOR SCHEDULE

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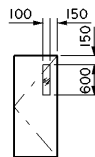
DOOR TYPES



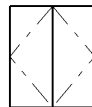
F (FLUSH)



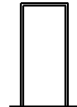
HG (HALF LITE)



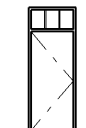
FNV (NARROW LITE)



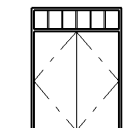
FP (FLUSH PAIR)



TYPE I
(SINGLE DOOR)



TYPE 2
(SINGLE DOOR W/O.H.)



TYPE 3
(DOOR PAIR W/O.H.)

DOOR FRAME TYPES

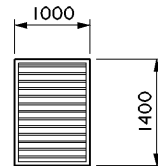
LOUVER SCHEDULE

MARK	NOMINAL ROUGH OPENING (W X H or DIA. mm)	MAT'L.	FIN./COLOR	DETAILS			SEE NOTE
				HEAD	JAMB	SILL	
L1		ALUMINUM	ANOD./MED. BRONZE	X/A501	X/A501	X/A501	
L2		ALUMINUM	ANOD./MED. BRONZE	X/A501	X/A501	X/A501	
L3		ALUMINUM	ANOD./MED. BRONZE	X/A501	X/A501	X/A501	
L4		ALUMINUM	ANOD./MED. BRONZE	X/A501	X/A501	X/A501	

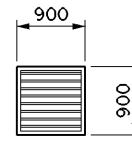
WINDOW SCHEDULE

MARK	NOMINAL ROUGH OPENING (W X H mm)	MAT'L.	FIN./COLOR	DETAILS			SEE NOTE
				HEAD	JAMB	SILL	
WI	1600 X 1400	ALUMINUM	ANOD./MED. BRONZE	X/A501	X/A501	X/A501	

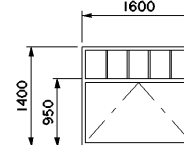
LOUVER TYPES



LI



L4



W

WINDOW TYPES

WINDOW & LOUVER NOTES

EXTERIOR FINISH SCHEDULE

MARK	FINISH DESCRIPTION	MARK	FINISH DESCRIPTION	MARK	FINISH DESCRIPTION
CRT-1	CONCRETE ROOFING TILE			EPT-1	PAINT (DOORS/FRAMES, TRANSOM WINDOWS & GALV. STEEL DOOR LINTELS)
	MFR: MONIER LIFE TILE				MFR: SHERWIN WILLIAMS
	STYLE: SLATE				STYLE: GLOSS
	COLOR: NORTHWEST GRAY C/T				COLOR: 6153, PROTEGE BRONZE
FBU-1	FACE BRICK UTILITY - (FIELD COLOR TO BE USED AS SHOWN ON ELEVATIONS)	MTL-1	COPING, GUTTERS, CORNICE, DOWN-SPOUTS & THRU-WALL FLASHING	EPT-2	PAINT (GALV. STEEL VTRS/FLUES)
	MFR: MUTUAL MATERIALS		STYLE: FACTORY APPLIED PVF FINISH		MFR: SHERWIN WILLIAMS
	STYLE: MISSION/WIRECUT		COLOR: WEATHERED COPPER		STYLE: GLOSS
	COLOR: VINTAGE	PCU-1	PRECAST CONCRETE WINDOW SILLS	EPT-3	COLOR: 2133, DRAMATIC BLACK
			COLOR:		NOT USED
FBU-2	FACE BRICK UTILITY - (ACCENT COLOR TO BE USED AS SHOWN ON ELEVATIONS)				
	MFR: MUTUAL MATERIALS	MRT-1	MORTAR		
	STYLE: MISSION/WIRECUT		MFR: MUTUAL MATERIALS		
	COLOR: MAINA LOA		COLOR:		

EXTERIOR FINISH SCHEDULE NOTES

I. MANUFACTURERS ARE LISTED FOR COLOR AND TEXTURE REFERENCE ONLY AND ARE NOT INTENDED TO LIMIT SELECTION OF MATCHING COLORS AND TEXTURES BY OTHER MANUFACTURERS.



**S Army Corps
Engineers
Seattle District**

GENERAL NOTES:

1.

[illegible]

Corps of Engineers Seattle, Washington	Drawn by: THORNTON	File # 28FEB03
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Prepared by:	Rev.	

DOOR, WINDOW, LOUVER &
EXT. FINISH SCHEDULES

FT. LEWIS PN 53636 WASHINGTON

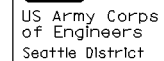
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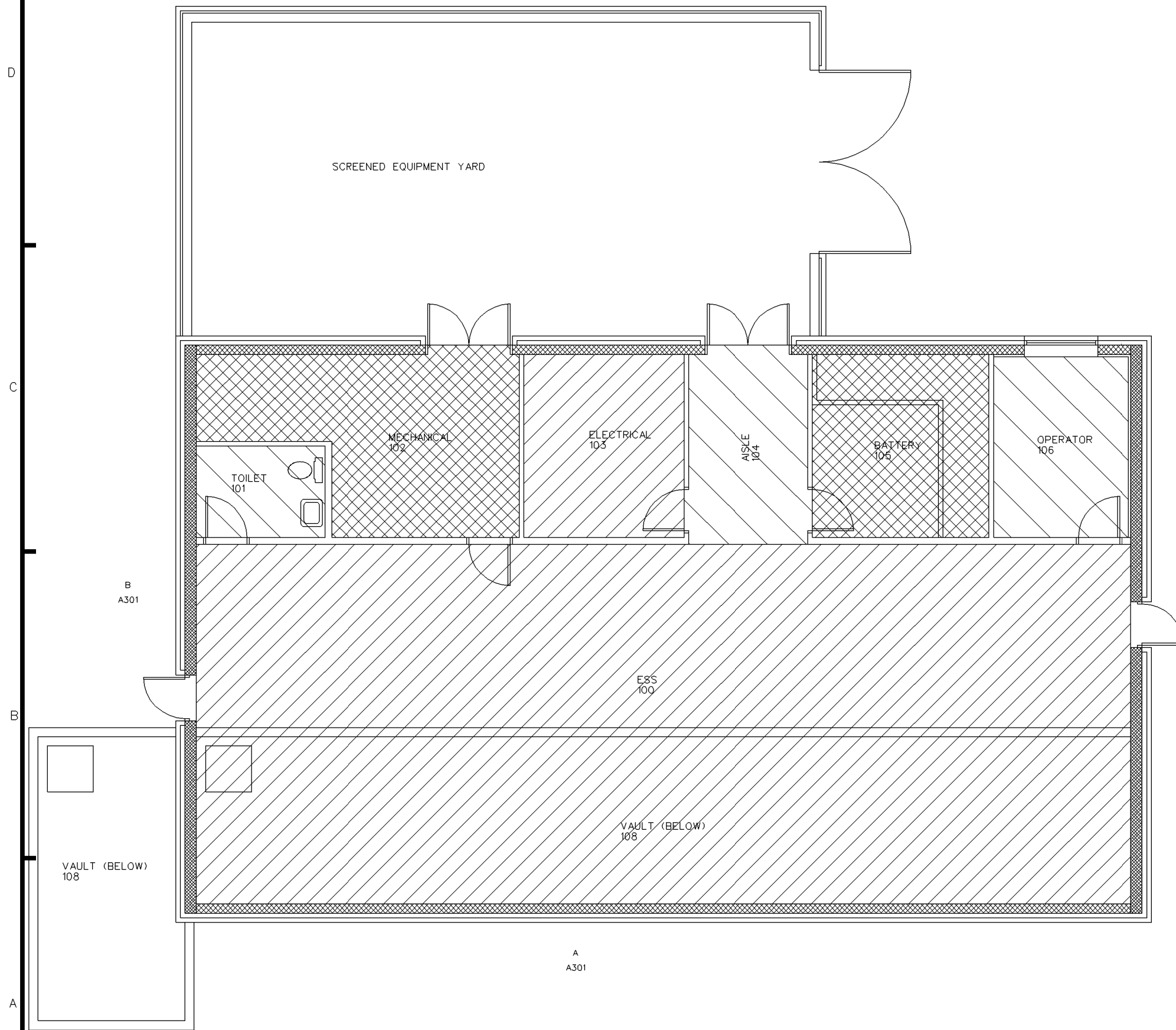
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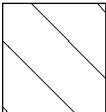
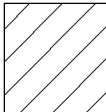
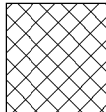
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	Drawn by:	File • 22s/721-12-17
	Checked by:	Rev.
Prepared by:		

FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
FIRE PROTECTION
PLAN
FT. J. WIS PN 53636 WASHINGTON

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VOLUME 6

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	LIGHT HAZARD	ORDINARY HAZARD GROUP 1	ORDINARY HAZARD GROUP 2
DESIGN DENSITY (L/min/m²)	4.1	6.1	8.2
DESIGN AREA (m²)	280	280	280
HOSE STREAM ALLOWANCE (L/min)	950	1900	1900
DURATION OF SUPPLY (min)	60	90	90

NOTES:

1. PER NFPA-13, INCREASE THE AREA OF SPRINKLER OPERATION BY 30% WITHOUT REVISING THE DENSITY FOR ALL AREAS BECAUSE OF THE USE OF A DOUBLE INTERLOCK PREACTION SYSTEM.

2. PER NFPA-13, FOR AREAS WITH SLOPED CEILINGS THAT HAVE A SLOPE IN EXCESS OF ONE IN SIX, INCREASE THE AREA OF SPRINKLER OPERATION AN ADDITIONAL 30% WITHOUT REVISING THE DENSITY.

NOTE FOR REVIEWERS: FIRE PROTECTION DETAILS, INCLUDING THE LOCATION OF THE FP RISER, HAVE NOT BEEN WORKED OUT YET. SINCE THERE IS NO SITE DESIGN YET, EXPECT TO WORK OUT THE FP DETAILS WHEN THE SITE DESIGN IS FURTHER DEVELOPED (STARTED).

29 JUN 05
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FAN SCHEDULE											
MARK NO.	AREA SERVED	AIR FLOW (L/s)	SP P ₀	TYPE	SONES	RPM	ELECTRICAL DATA				REMARKS
							W	VOLTS	PHASE	HZ	
EF-1	ESS ECONOMIZER SYSTEM	3068	249	INLINE CENTRIFUGAL		1315	1678	208	3	60	INCLUDES MOTORIZED DAMPERS AND WEATHERHOOD WITH INSECT SCREEN AT THE WALL. GREENHECK TCB-1-24 OR EQUAL.
EF-2	BATTERY ROOM	241	31	PROPELLER SIDEWALL		1650	78			60	INCLUDES MOTORIZED DAMPERS AND WEATHERHOOD WITH INSECT SCREEN AT THE WALL. GREENHECK S1-10-428-P OR EQUAL.
EF-3	MECH AND ELECT ROOMS	290	31	PROPELLER SIDEWALL		1350	135			60	INCLUDES MOTORIZED DAMPERS AND WEATHERHOOD WITH INSECT SCREEN AT THE WALL. GREENHECK S1-10-440-G OR EQUAL.
EF-4	TOILET ROOM	94	25	CEILING EXHAUST	2.0			120		60	CEILING EXHAUST FAN WITH GRILLE, RATED FOR CONTINUOUS DUTY, DUCTED TO OUTSIDE (WITH WALL CAP OR ROOF CAP AND INSECT SCREEN). NUTONE QT200 OR EQUAL.
RF-1	OPERATOR ROOM RETURN AIR	340	25	CEILING EXHAUST	5.0		57			60	CEILING EXHAUST FAN WITH GRILLE, RATED FOR CONTINUOUS DUTY, EXHAUSTS DIRECTLY TO CEILING SPACE ABOVE THE OPERATOR ROOM. NUTONE QT700 OR EQUAL.

TRANSFER GRILLE SCHEDULE						
MARK NO.	LOCATION	MOUNTING SYSTEM	NOMINAL L/s	Size (mmXmm)	MAX. P.D. (Pa)	REMARKS
TG-1	BATTERY ROOM DOOR	DOOR MOUNTED	330	406 x 864	12	PRICE ATG1 OR EQUAL. INCLUDE DOOR UNDERCUT OF 13-19 mm.
TG-2	BATTERY/AISLE WALL	WALL MOUNTED	236	508 x 406	19	PRICE ATG1 OR EQUAL.
TG-3	TOILET ROOM DOOR	DOOR MOUNTED	89	305 x 254	19	PRICE ATG1 OR EQUAL. INCLUDE DOOR UNDERCUT OF 13-19 mm.
TG-4	ELECT/MECH WALL	WALL MOUNTED	47	406 x 254	3	PRICE ATG1 OR EQUAL.

LOUVER SCHEDULE						
MARK NO.	LOCATION	SERVICE	NOMINAL AIRFLOW (L/s)	SIZE W X H (mm x mm)	MIN FREE AREA (m ²)	REMARKS
L-1	EAST WALL	SUPPLY	3300	1830 x 1220	1.1297	WIND-DRIVEN RAIN RESISTANT LOUVER WITH INSECT SCREEN AND MOTORIZED DAMPERS. RUSKIN EME745 OR EQUAL.
L-2	NORTH WALL MECH RM	SUPPLY	236	915 x 460	0.1802	
L-3	NORTH WALL ELECT RM	SUPPLY	47	460 x 305	0.0437	SAME AS ABOVE, BUT ALSO INCLUDING HIGH EFFICIENCY FILTERS.

GAS FIRED BOILER SCHEDULE																	
MARK NO.	LOCATION	SERVICE	INPUT RATING (kW)	OUTPUT RATING (kW)	DOE AFUE	WATER CON. (mm)	NG CON. (mm)	FLUE (mm)	E. W. T. (°C)	L. W. T. (°C)	FUEL	GAS PRESSURE RANGE (kPa)	ELECTRICAL DATA				REMARKS
													kW	VOLTS	PHASE	HZ	
B-1	MECH ROOM	HYDRONIC HEATING WATER	22.0	18.2	84%	38	13	130	71.1	82.2	NG	1.12-2.61				60	LOCHINVAR SOLUTION CBN075 OR EQUAL.

CEILING MOUNTED AIR CONDITIONING UNIT SCHEDULE															
MARK NO.	LOCATION	DX COOLING CAPACITY		BLOWER			EVAPORATOR COIL		CONNECTION SIZES			ELECTRICAL DATA			REMARKS
		NET COOLING CAPACITY* (kW)	SENSIBLE COOLING CAPACITY* (kW)	L/s	P _a	MOTOR W	ROWS	FACE AREA (m ²)	LIQUID (mm)	HOT GAS (mm)	CONDENSATE DRAIN (mm)	VOLTS	PHASE	HZ	
ACU-1	ESS	9.6	8.0	668	75	373	3	0.26	13	22	22	208		60	STULZ AIR TECHNOLOGY SYSTEMS CEILAIR OHS-040-AR OR EQUAL.
ACU-2 THROUGH ACU-6: IDENTICAL TO ABOVE															

*RATED AT 23.9°C db, 16.9°C wb, 50% RH, INCLUDES STANDARD DX EVAPORATOR MOTOR HEAT.

AIR COOLED CONDENSER SCHEDULE												
MARK NO.	LOCATION	TYPE	FAN		CONDENSER COIL		CONNECTION SIZES		ELECTRICAL DATA			REMARKS
			L/s FREE DISCHARGE	MOTOR W	ROWS	FACE AREA (m ²)	LIQUID (mm)	HOT GAS (mm)	VOLTS	PHASE	HZ	
CU-1	YARD	REMOTE OUTDOOR PROPELLER FAN AIR-COOLED CONDENSER	991	186	4	0.39	16	22	208		60	STULZ AIR TECHNOLOGY SYSTEMS HES-036-LAA OR EQUAL.
CU-2 THROUGH CU-6: IDENTICAL TO ABOVE												

EXPANSION TANK SCHEDULE						
MARK NO.	LOCATION	UNIT SERVED	TANK VOLUME (L)	ACCEPTANCE VOLUME (L)	TYPE	REMARKS
EXT-1	MECH ROOM	B-1				

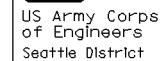
AIR SEPARATOR SCHEDULE				
MARK NO.	LOCATION	SERVICE	CAPACITY (L/s)	REMARKS
AS-1	MECH ROOM	HEATING WATER		

HYDRONIC BASEBOARD HEATER SCHEDULE			
MARK NO.	LOCATION	LENGTH (mm)	
BB-1	OPERATOR	914	
BB-2	OPERATOR	610	
BB-3	TOILET	610	
BB-4	ELECTRICAL	610	

PUMP SCHEDULE													
MARK NO.	SERVICE	UNIT SERVED	L/s	HEAD (m H2O)	RPM	SPECIFIC GRAVITY	TYPE	COUPLING	ELECTRICAL DATA				REMARKS
									kW	VOLTS	PHASE	HZ	
CP-1	HYDRONIC/HEATING					1.0						60	--
CP-2	HYDRONIC/HEATING					1.0						60	--
CP-3	RECIRCULATION					1.0						60	--

UNIT HEATER SCHEDULE				
MARK NO.	UH-1	UH-2	UH-3	UH-4
TYPE DISCHARGE	HORIZ.	HORIZ.	HORIZ.	HORIZ.
COIL CAPACITY (KW)				
CONTROL VALVE Cv				
CONTROL VALVE TYPE				
BALANCING VALVE REQUIRED?				
ENT. AIR TEMP (C)				
FAN MOTOR KW				
RPM				
V/PHASE/HZ				
SERVES ROOM	ESS	ESS	ESS	MECH
REMARKS	TRANE 38-S OR EQUAL.	TRANE 38-S OR EQUAL.	TRANE 38-S OR EQUAL.	TRANE 18-S OR EQUAL.

29 JUN 05
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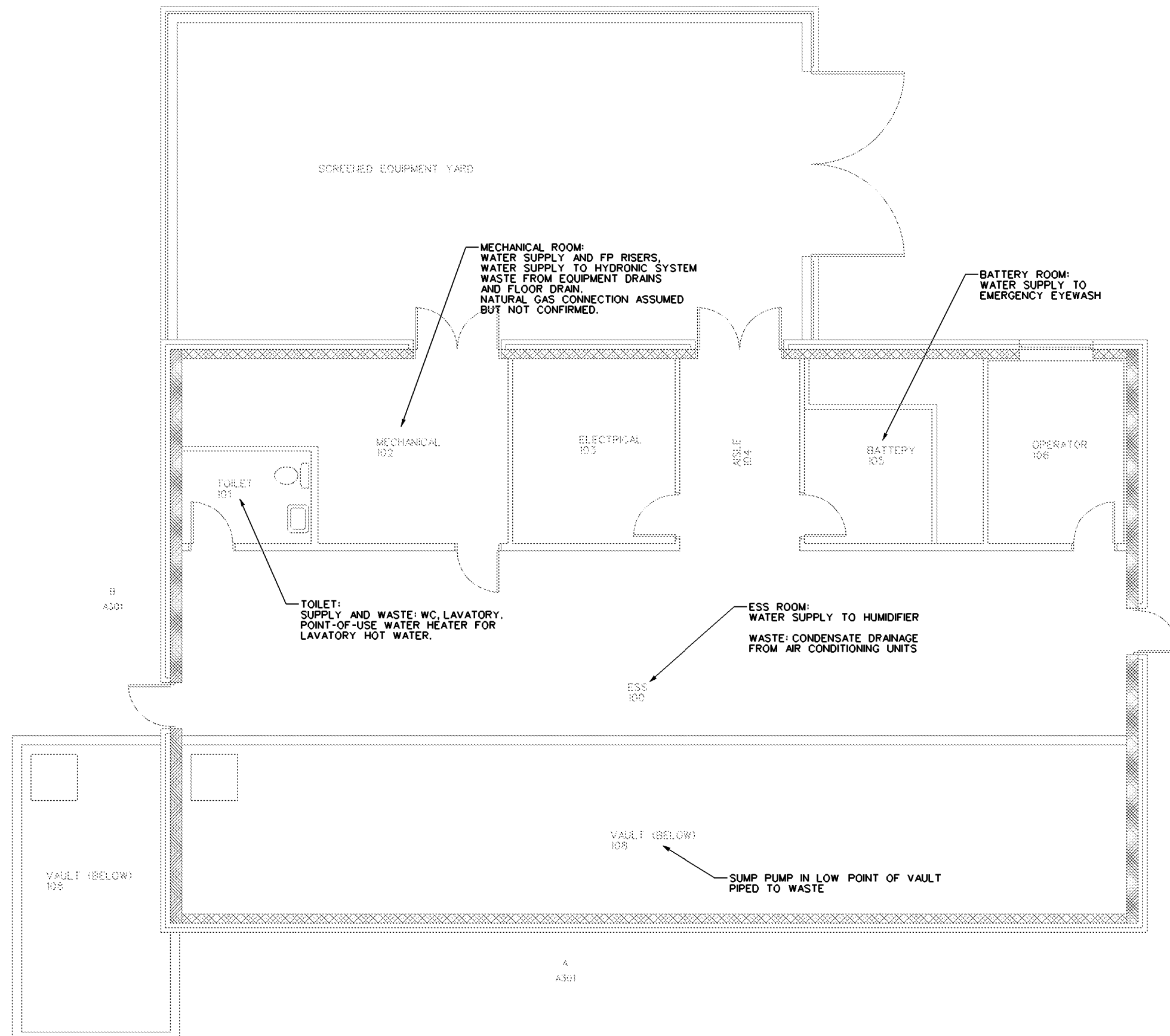
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	Drawn by: CHIRIAC	File # 22s/721-12-17
	Checked by:	Rev.
Prepared by:		

FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
PLUMBING PLAN

Plate
number:
P-101
Sheet of -
VOLUME 6

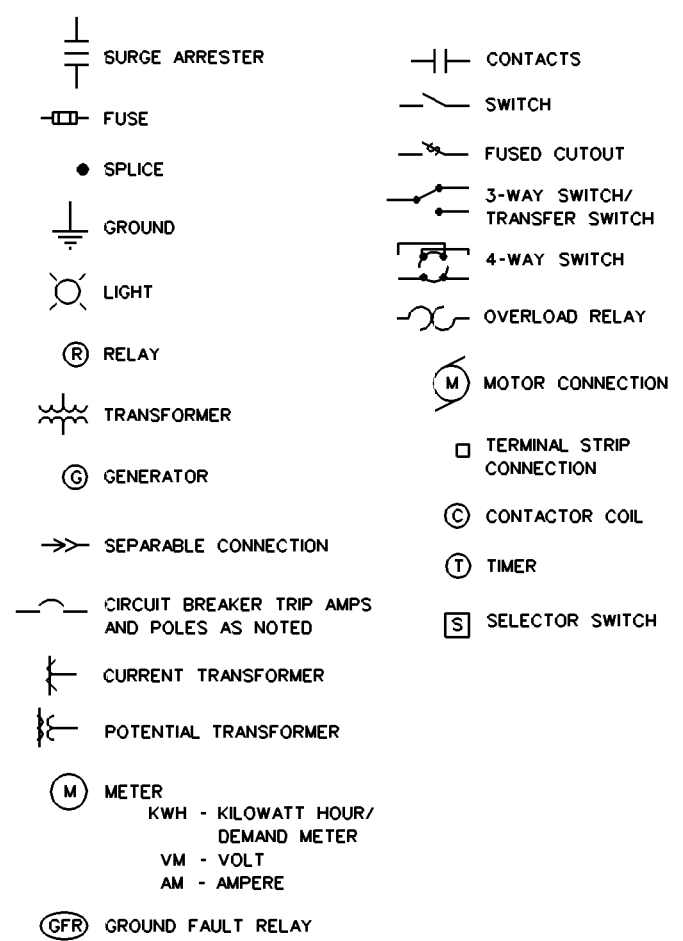
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NOTE TO REVIEWERS: THE PLUMBING DESIGN HAS NOT BEEN DEVELOPED YET BECAUSE OF THE LACK OF A SITE PLAN AND THE SHORTAGE OF TIME SINCE THE BUILDING FLOORPLAN WAS CHANGED. THE PLUMBING DESIGN WILL BASICALLY FOLLOW THE DESIGN IN THE FY95 RSU IN NORTH FORT LEWIS.

29 JUN 05
REVIEW SET

SCHEMATICS AND ONE LINE



29 JUN 05
REVIEW SET

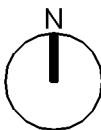
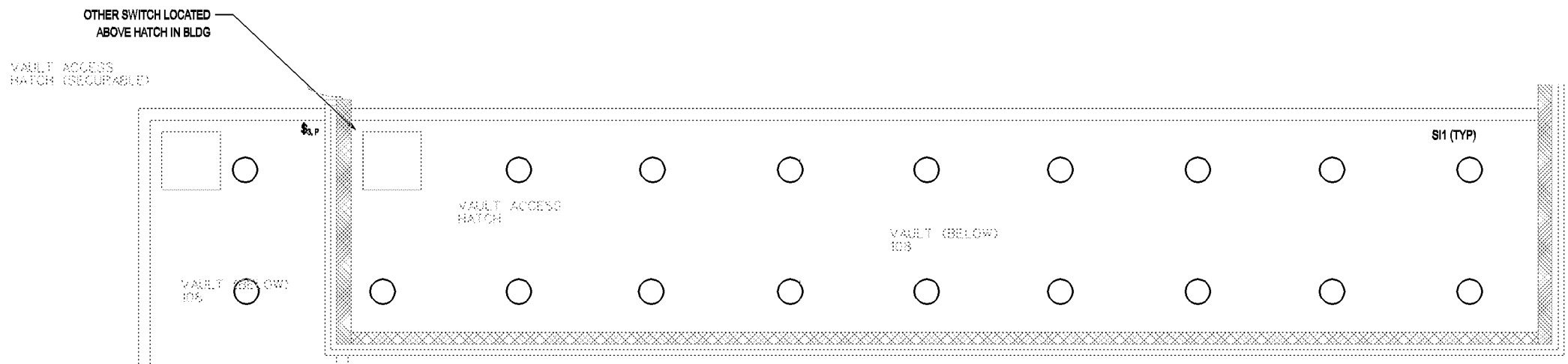
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U.S.ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Designed by: DUVALL Drawn by: DUVALL Checked by: LIE	Date: 28FEB05 File # 22s/721-12-17 Rev.
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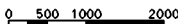
FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
LIGHTING PLAN
VAULT

FT. LEWIS PN 53636 WASHINGTON

Plate
number:
E-102
Sheet of -
VOLUME 6

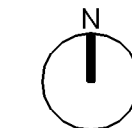


PLAN NORTH

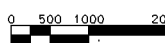


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PLAN NOR



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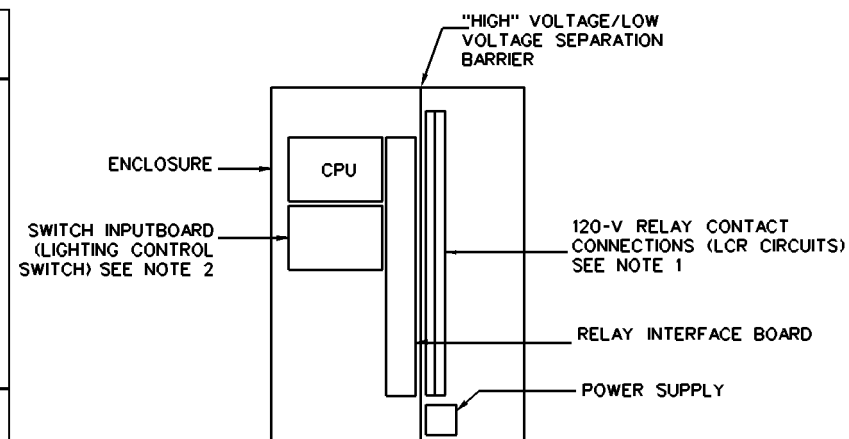
29 JUN 05
REVIEW SE

LIGHTING FIXTURE SCHEDULE

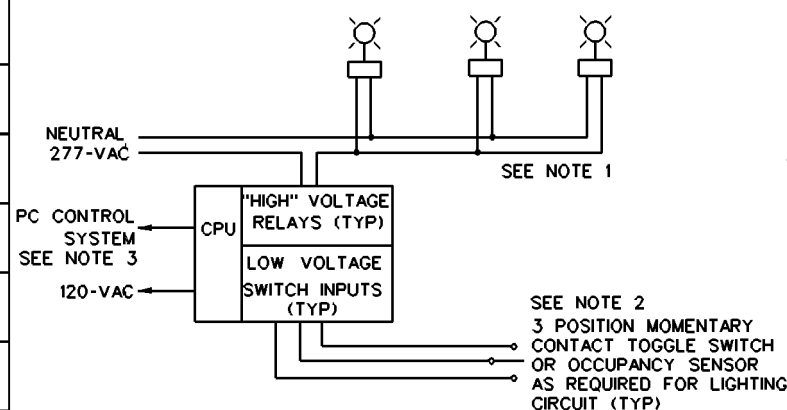
SYMBOL	TYPE	NO. LAMPS	WATTS / LAMP	LUMENS	VOLTS	REMARKS
PF1	FLUORESCENT	2	32	2850	120	3M AFF ESS RM, BATTERY RM
PF2	FLUORESCENT	1	32	2850	120	PENDANT ELEC, MECH, STORAGE RMS
RF1	COMPACT FLUORESCENT	2	26			RECESSED DOWNLIGHT CORRIDOR
RF2	COMPACT FLUORESCENT	2	26	2850		RECESSED DOWNLIGHT WET LOCATION, TOILET
RF3	FLUORESCENT	2	32			RECESSED OPERATOR OFFICE
SI1	INCANDESCENT	1	200	4000		WET LOCATION VAULT LIGHT
WM1	METAL HALIDE	1	70			EXTERIOR WALL MOUNT
WF1	FLUORESCENT	2	32			TOILET, OVER SINK
X1	LED		8			EXITS

NOTES:

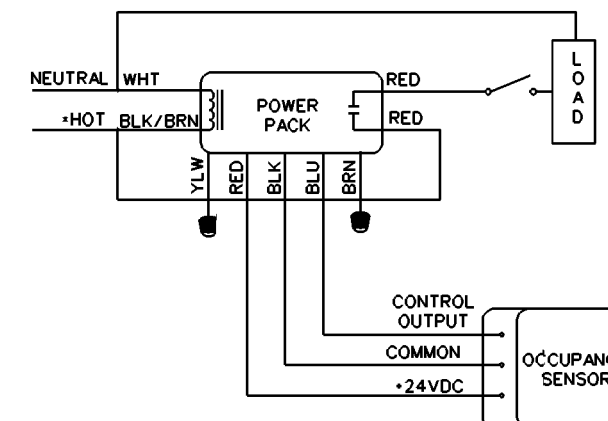
1. FUTURE TYPES INDICATED ON THE DETAIL SHEETS SHALL ALSO CONFORM TO REQUIREMENTS SPECIFIED AND INDICATED IN THE CONTRACT DOCUMENTS.
2. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL LIGHTING FIXTURES MOUNTED ON OR RECESSED IN THE CEILING.
3. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF WALL MOUNTED LIGHTING FIXTURES.
1. REFER TO LIGHTING FLOOR PLANS AND PANEL SCHEDULES FOR ALL LIGHTING CIRCUITS.
2. PROVIDE SWITCHING CONTROL CONDUCTORS AS RECOMMENDED BY CONTROL SYSTEM MANUFACTURER.
3. PROVIDE SOFTWARE FOR THE CONTROL SYSTEM INSTALLED ON THE COMPUTER AND A BACKUP COPY ON CD. SEE SPECS. COORDINATE WITH MANUFACTURER OF THE APPROPRIATE SOFTWARE INSTALLED.
4. OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY TYPE UTILIZING ULTRASONIC AND PIR TECHNOLOGIES, UNLESS OTHERWISE NOTED. SENSORS SHALL HAVE AN INTEGRAL TIMER TO TURN LIGHTS OFF WHEN NO OCCUPANCY IS DETECTED. OCCUPANCY SENSORS SHALL BE USED FOR ALL OFFICE ROOMS, CONFERENCE ROOMS, AND TOILET/ RESTROOMS. COORDINATE WITH MANUFACTURE FOR NUMBER AND LOCATION OF DEVICES, DEPENDANT UPON ROOM SIZE.
5. IN AREAS WITH WINDOWS AND SKYLIGHTS, OCCUPANCY SENSORS ALONG WITH DAYLIGHT SENSORS SHALL BE USED FOR LIGHTING CONTROL. COORDINATE WITH MANUFACTURER FOR NUMBER AND LOCATION OF DEVICES.
6. IN ELECTRICAL, MECHANICAL AND COMMUNICATION SPACES, OCCUPANCY SENSORS SHALL BE WALL MOUNTED. COORDINATE WITH MANUFACTURER FOR DETAILS.
7. CORRIDORS, FOYERS, LOBBIES AND VESTIBULE LIGHTS SHALL BE CONTROLLED THROUGH THE LIGHTING CONTROL RELAY PANEL.
8. PIR SENSORS SHALL BE USED FOR SUPPLY ROOM, JANITOR ROOM, AND STORAGE ROOMS. COORDINATE WITH MANUFACTURER FOR NUMBER AND LOCATION OF DEVICES.



LOW VOLTAGE LIGHTING CONTROL



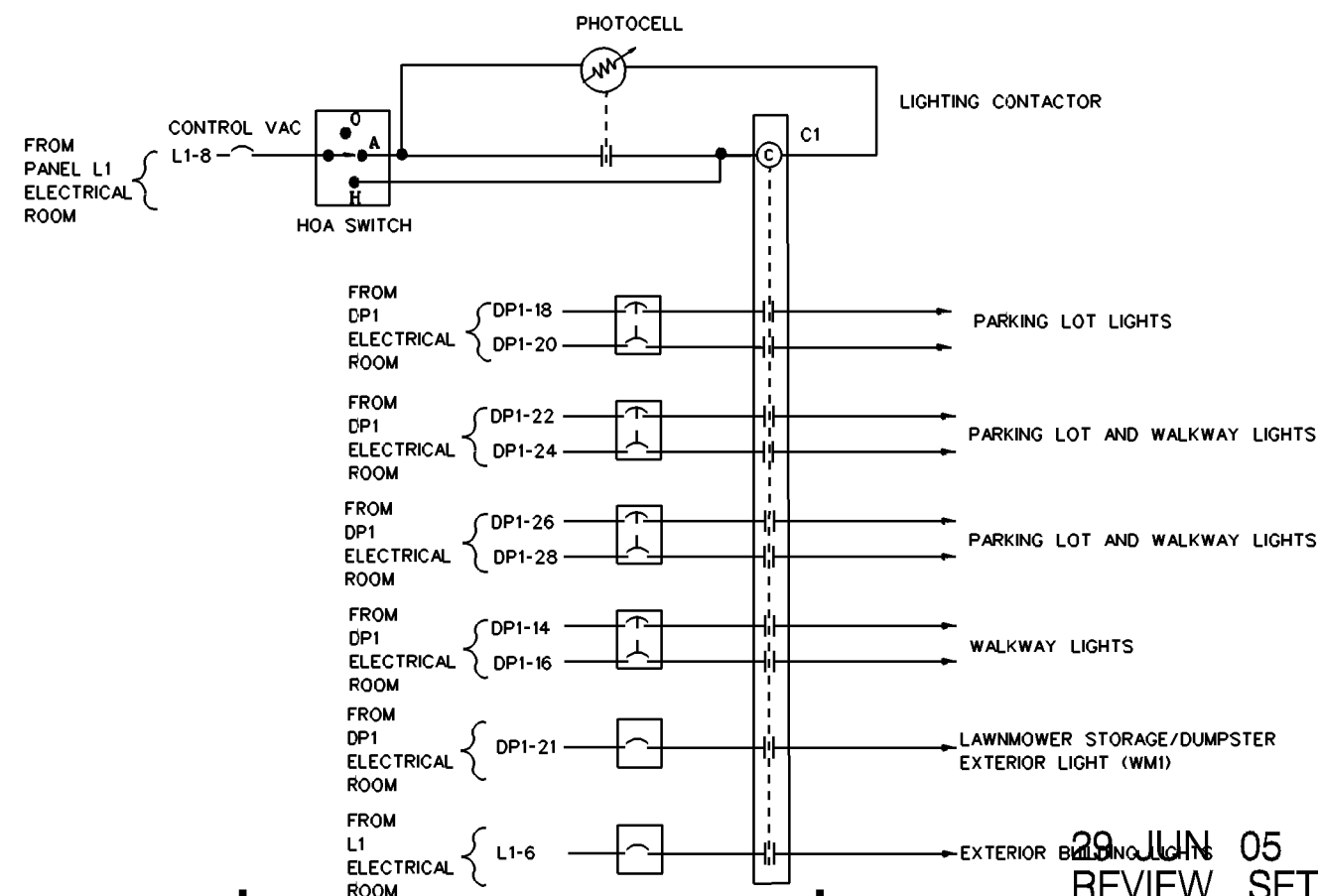
LOW VOLTAGE LIGHTING CONTROL



**TYPICAL DIAGRAM FOR ANY 3-WIRE
OCCUPANCY SENSOR (CEILING/WALL MOUNTED)**

SEE NOTES 4 AND 6

NOTES:



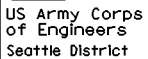
US Army Corps
of Engineers
Seattle District

[illegible]

U.S. ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Designed by: Drawn by: Checked by: Prepared by:	Date: 28 FEB 85 File # 22s/721-12-17 Rev.
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FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
LIGHTNING PROTECTION
AND VAULT PLANS
FT. LEWIS PN 53636 WASHINGTON

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number:
E-502
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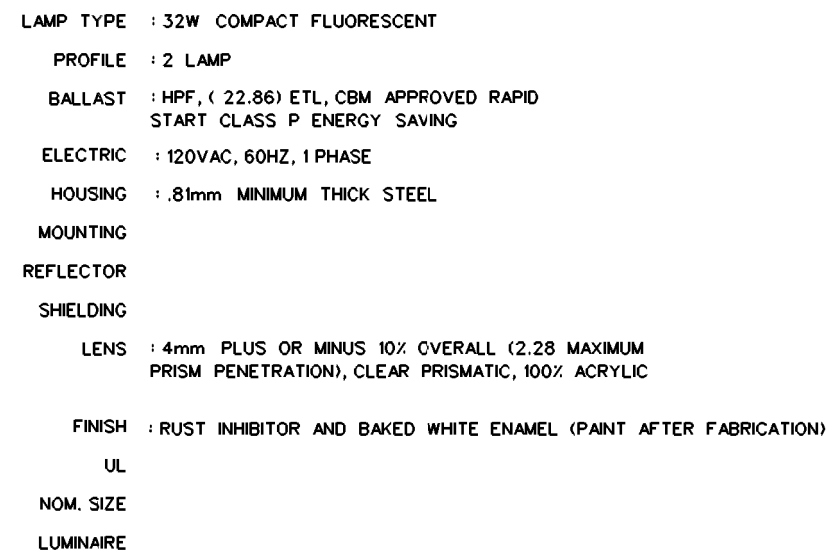


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	Checked by:	
	Drawn by:	
	Date:	28 FEB 80

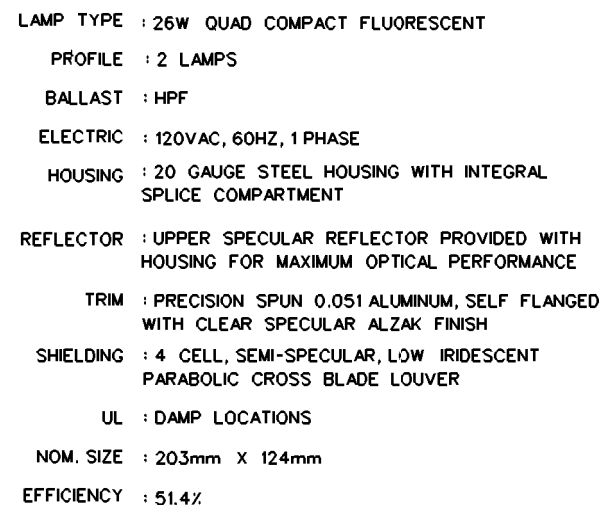
FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
LIGHTING
DETAILS I

Plate
number:
E-503
Sheet of -
VOLUME 6



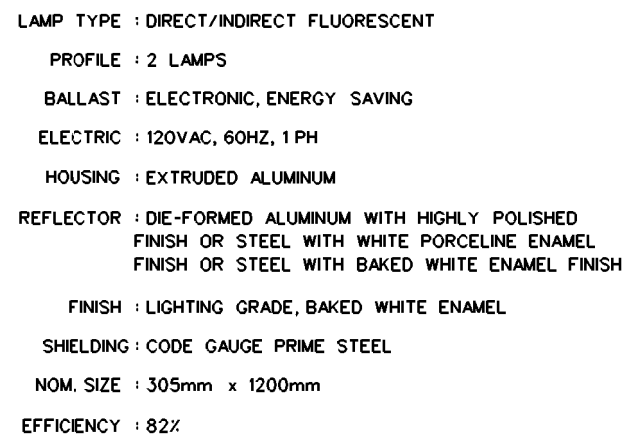
PF1 STEEL SIDED PENDANT FLUORSCENT

NOT TO SCALE



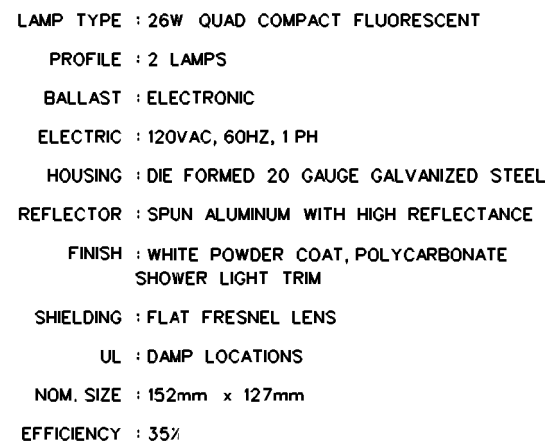
RF1 CAN LIGHT

NOT TO SCALE



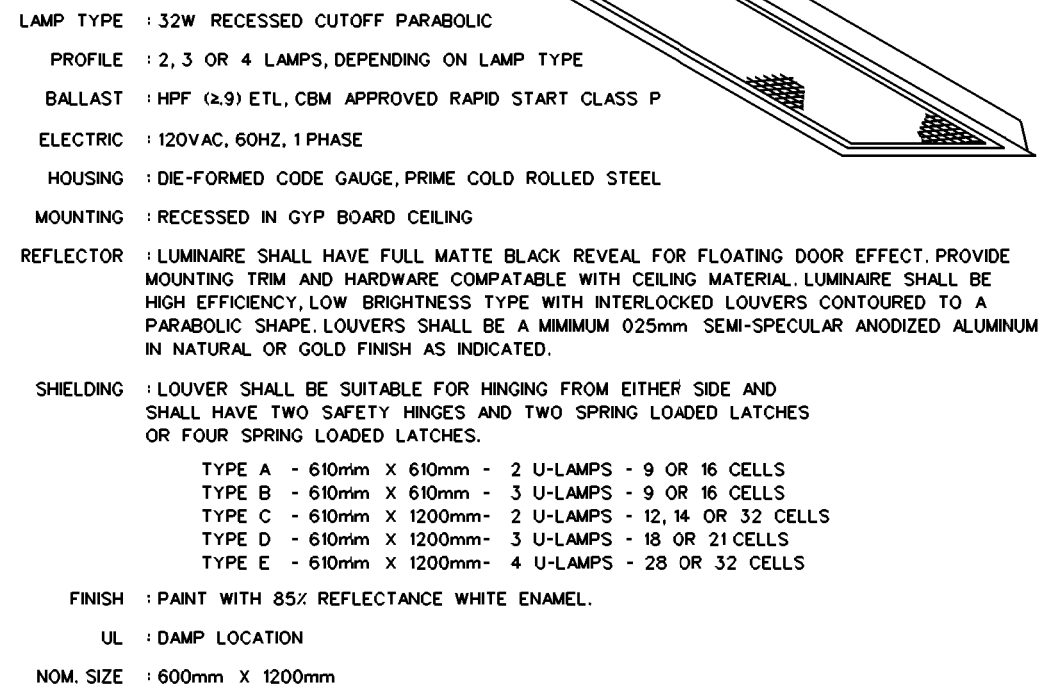
PF2 INDUSTRIAL PENDANT FIXTURE

NOT TO SCALE



RF2 TOILET LIGHT

NOT TO SCALE



RF3 PREMIUM STATIC TROFFER

NOT TO SCALE

29 JUN 05
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DATE AND TIME PLOTTED: 26-JUL-2005 14:39

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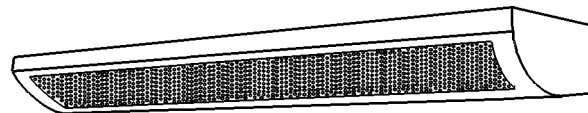
U.S. ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Prepared by: _____ Designed by: _____ Drawn by: _____ Checked by: _____ Rev. _____	Date: 28 FEB 05 File # 22s/721-12-17
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FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING

LIGHTING
DETAILS II

FT. LEWIS PN 53636 WASHINGTON

Plate
number:
E-504
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VOLUME 6



LAMP TYPE : 32W T8 DIRECT/INDIRECT FLUORESCENT

PROFILE : 2 LAMPS

BALLAST : ELECTRONIC

ELECTRIC : 120VAC, 60HZ, 1 PHASE

HOUSING : 20 GAUGE DIE FORMED STEEL BODY WITH 14 GAUGE DIE FORMED INTERNAL JOINER SYSTEM

REFLECTOR : DIE FORMED, SPECULAR ACRYLIC LIGHT STABILIZED LENS DIFFUSER OVER PERFORATIONS

FINISH : STANDARD WHITE WITH FLAT END CAP

NOM. SIZE : 74mm X 55mm X 1220mm

SI1 INCANDESCENT WITH WIRE GUARD



LAMP TYPE : 70W METAL HALIDE

PROFILE : 1 LAMP WITH MEDIUM BASE

BALLAST : HPF

ELECTRIC : 120VAC, 60HZ, 1 PH

HOUSING : SINGLE PIECE DIE-CAST ALUMINUM

MOUNTING : WALL MOUNT

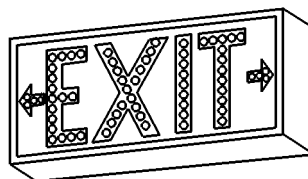
REFLECTOR : HIGHLY SPECULAR ALUMINUM WITH
WIDE THROW DISTRIBUTION

SHIELDING : BOROSILICATE GLASS LENS AND
ONE-PIECE GASKET

FINISH : TEXTURED SEMI-GLOSS POLYESTER
POWDER COAT

NOM. SIZE : 308mm X 135mm X 178mm

WM2 WALL MOUNT, BEACON
NOT TO SCALE



LAMP TYPE : DIFFUSED RED LED
ELECTRIC : 120VAC, 60HZ, 1 PHASE
HOUSING : DIE CAST ALUMINUM
MOUNTING : UNIVERSAL
LENS : POLYCARBONATE
FINISH : BRUSHED ALUMINUM
NOM. SIZE : 216mm X 324mm
EFFICIENCY : 90 MINUTE BATTERY BACKUP
OTHER : FIRE ALARM FLASH

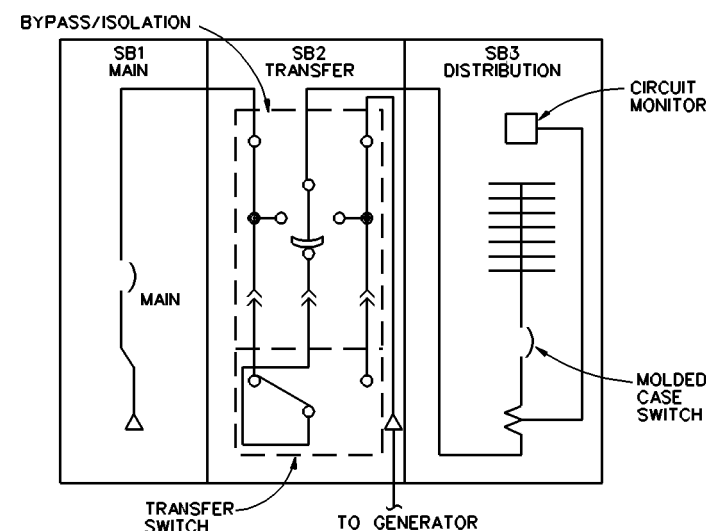
X1 EXIT SIGN
NOT TO SCALE

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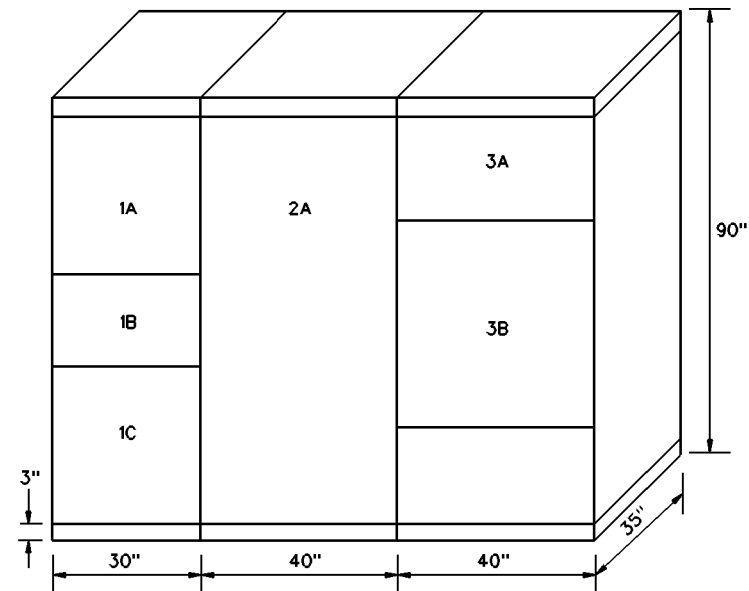
U.S. ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Prepared by:	
	Checked by:	
	Drawn by:	
	Date:	28 FEB 80

FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
SWITCHBOARD
DETAILS

Plate
number:
E-505
Sheet of -
VOLUME 6



SWITCHBOARD ONE-LINE  **4**
NOT TO SCALE  **4**



MAINS: X00 A PHASE, 1.73% NEUTRAL, GROUND BUS, ISOLATED GROUND BUS		NEMA 1 ENCLOSURE	
VOLTAGE: 208Y/120V, 3Ø		SWITCHBOARD SCHEDULE	
		SERVICE ENTRANCE LABEL FRONT ACCESS	
SPACE	DESCRIPTION	CIRCUIT BREAKER	REMARKS
1A	SPACE	X00A-3P	X00A-3P
1B	MAIN		
1C	TERMINATION		
2A	ATS BP/IS		
3A	CIRCUIT MONITOR		
3B	DISTRIBUTION PANEL PP		INSTALL SURGE PROTECTORS
3C	C.T.'S 3 (X00:X)		

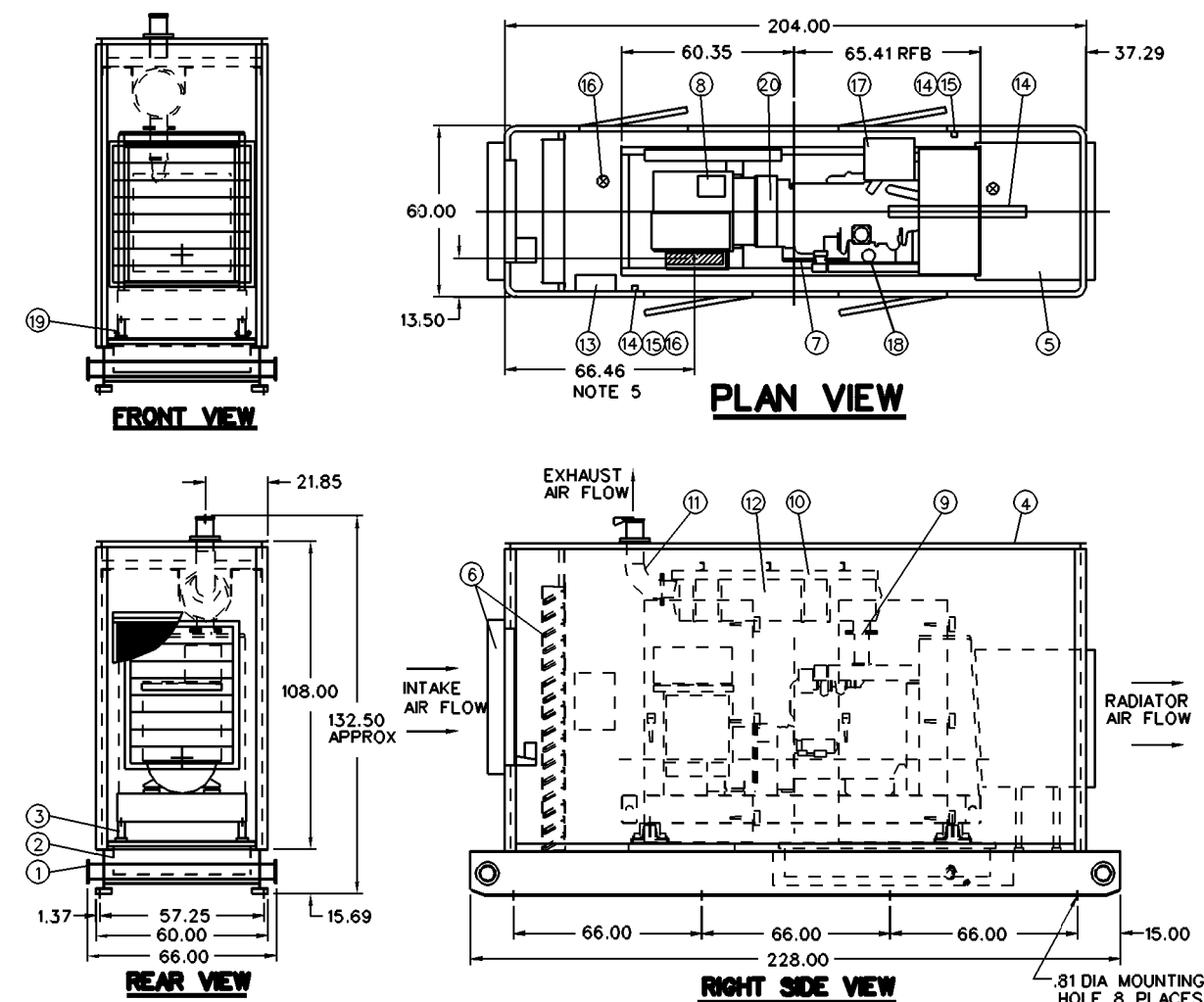
MAIN SWITCHBOARD ELEVATION

NOT TO SCALE

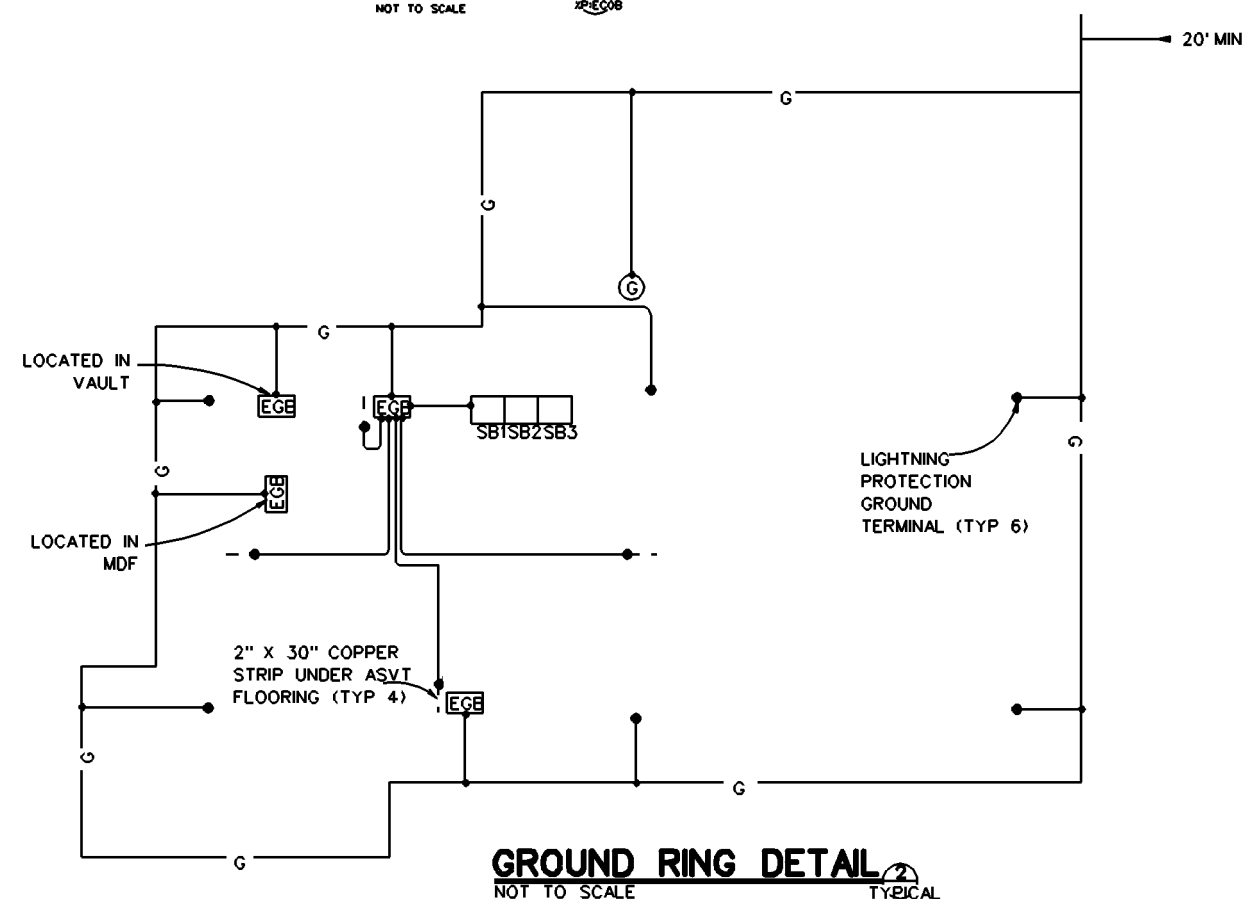
3
TYPICAL

COMP	QTY	DESCRIPTION
1	1	WIDE FLANGE BEAM SKID BASE WITH TOW PIPE PROVISIONS, FULL DECK PLATE FLOORING, AND INTEGRAL 250 GAL RUPTURE BASIN WITH LEAK DETECTOR ALARM SWITCH.
2	1	300 GAL FUEL TANK WITH DECK PLATE FLOOR, STANDARD FITTINGS WITH FUEL LEVEL GAUGE AND LOW FUEL LEVEL ALARM SWITCH.
3	1	VIBRATION SPRING ISOLATOR GROUP
4	1	.04 ALUMINUM ENCLOSURE 60W X 108H X 204L - (4) 38W X 85H DOORS - THREE POINT DOOR LATCHES WITH INSIDE RELEASES AND PADLOCK PROVISIONS - INTERIOR WALL AND CEILING SOUND INSULATION (2.00 MINERAL WOOL AND 18 GA GALV PERFORATED STEEL LINER)
5	1	RADIATOR DISCHARGE SOUND ATTENUATOR MODULE WITH ALUMINUM GRAVITY DAMPER.
6	1	AIR INTAKE SOUND ATTENUATOR MODULE WITH MOTORIZED AIR INTAKE DAMPER AND #4 WIRE MESH BIRDSCREEN ASSEMBLY.
7	1	BATTERY RACK AND CABLE GROUP
8	1	BATTERY CHARGER
9	1	STAINLESS STEEL FLEX CONNECTOR
10	1	MUFFLER MOUNTING BRACKETS
11	1	EXHAUST ELBOW, RAIN CAP, & DRESS CAP
12	1	EXHAUST SYSTEM INSULATION BLANKET
13	1	BREAKER TYPE PANELBOARD 120/240V 1PH WITH 100 AMP BOLT-IN MAIN AND LOADS WIRED IN EMT CONDUIT.
14	2	FLUORESCENT LIGHT 40 WATT 120VAC WITH WALL MOUNTED 3 WAY SWITCHES.
15	2	DUPLEX RECEPTACLE GFI15 AMP 120VAC
16	2	INCANDESCENT LIGHT 24VDC WITH 1 HOUR WALL MOUNTED TIMER SWITCH.
17	1	SPACE HEATER 5KW 120VAC 1PH & T-STAT
18	1	FUEL/WATER SEPARATOR
19	1	OIL, WATER, & FUMES DISPOSAL LINE GROUP
20	1	GENERATOR SPACE HEATER

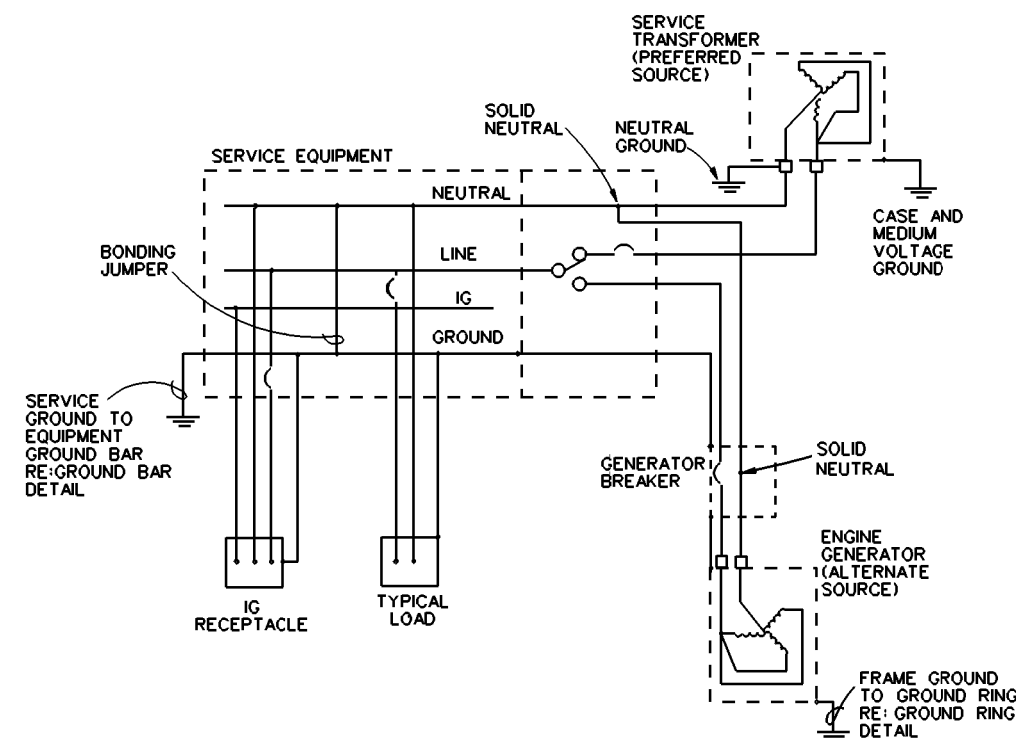
- NOTES -
1. RECOMMEND DISTANCE OF 60.00 BETWEEN ENCLOSURE AND ANY OTHER STRUCTURE.
 2. 4.00 x 20.00 ELECTRICAL STUB UP AREA
 3. APPROX DRY WEIGHT OF UNIT - 10,000 LBS
 4. UNIT SOUND LEVEL TO BE 80 DBA AT 20 FT
 5. DIMENSIONS SHOWN ARE IN INCHES AND ARE TYPICAL FOR THE UNIT SHOWN AND MAY VARY FOR OTHER MANUFACTURERS. COORDINATE SPECIFIC GENERATOR DIMENSIONS WITH THE ALLOTTED SPACE TO PROVIDE REQUIRED CLEARANCES.
 6. PROVIDE CONCRETE SLAB. SLAB SHALL BE 6" DEEP AND EXTEND 12" BEYOND THE GENERATOR FOOTPRINT USE #4 REBAR AT 12" ON CENTER. COORDINATE ANCHOR BOLT AND SPECIFIC REQUIREMENTS WITH MANUFACTURER.



GENERATOR
NOT TO SCALE



GROUND RING DETAIL
NOT TO SCALE



GROUNDING DETAIL
NOT TO SCALE

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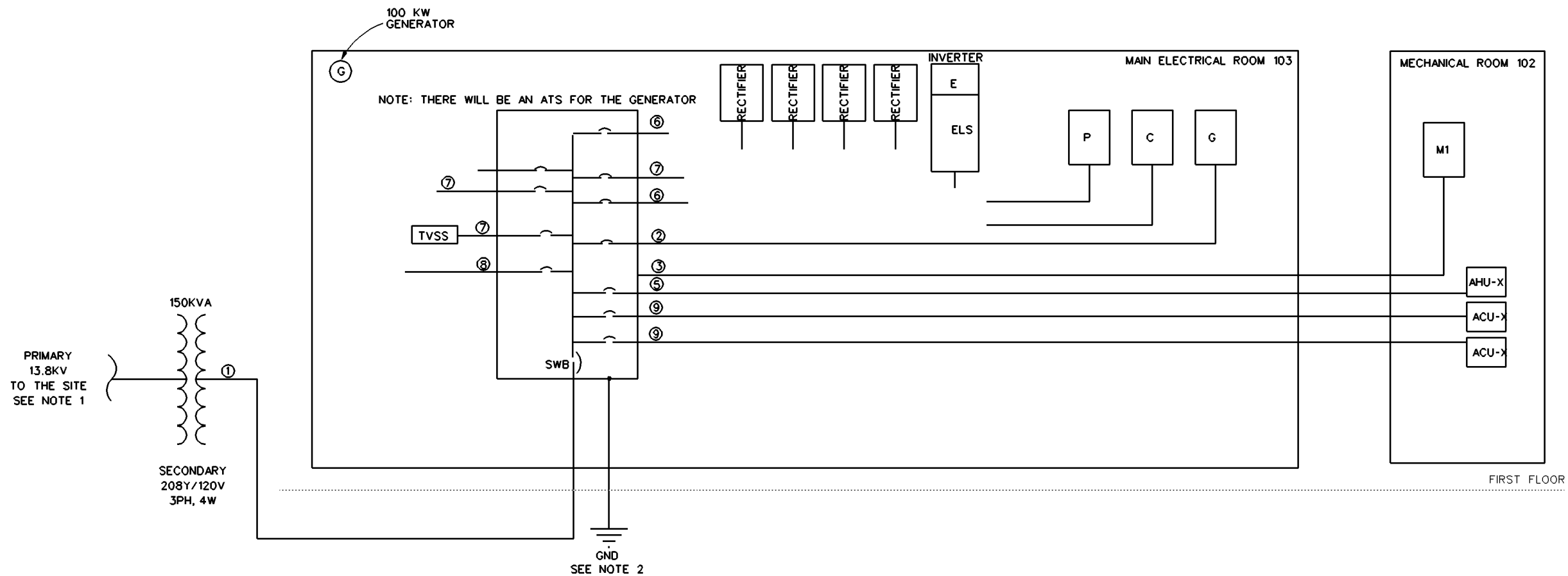
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U.S. ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Prepared by:	
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	Drawn by:	
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FY06 WHOLE BARRACKS RENEWAL
JACKSON AVENUE
REMOTE SWITCH UNIT BUILDING
ELECTRICAL
ONE LINE

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number:
E-601
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CABLE NUMBER	CONDUCTOR NUMBER & SIZE	CONDUIT SIZE
①		
②		
③		
④		
⑤		
⑥		
⑦		
⑧		
⑨		



POWER RISER DIAGRAM

NOTES:

1. SEE SITE POWER PLAN FOR PRIMARY DUCTBANK ROUTE AND TRANSFORMER LOCATION.
2. GROUND THE SWITCHBOARD (SWB) TO THE BUILDING AND TO THE GROUNDING SYSTEM.
3. FOR CIRCUIT BREAKER SIZES IN SWB, REFER TO PANEL SCHEDULE.

29 JUN 05
REVIEW SET

Synchronization and Demarcation Matrix for PN 72854 and PN 72838 as of 9 AUG 11

Item of Synchronization/Demarcation	PN72854: TEMF Contractor:Scope/Limit of Work	PN72838: Warehouse Contractor:Scope/Limit of Work	Work by Others: Scope/Limit of Work
Site Grading	TEMF Contractor will grade areas within the TEMF Project Construction limits in accordance with the Plans and Specifications. Site grading cannot occur in the zone above the old 16-inch AC water main until the new 16-inch DI water main has been put into operation by the Warehouse Contractor	Warehouse Contractor will grade areas within the Warehouse Project construction limits in accordance with the RFP and approved designs. Site grading cannot occur in the zone above the old 16-inch water main until the new 16-inch DI water main has been put into service. Warehouse Contractor will coordinate with the TEMF Plans to ensure grade match at set elevations along key boundary points.	NA
Site Clearing & Grubbing/Timber Harvesting	TEMF Contractor will clear and grub all trees and vegetation as indicated by the Plans. Merchantable trees will be stacked in Log Decks in areas designated by the Plans in accordance with Section 31.11.00- Clearing and Grubbing.	Warehouse Contractor will clear and grub all trees and vegetation as indicated by the Plans. Merchantable trees will be stacked in Log Decks in areas designated by the Plans in accordance with Section 01010 Para 6.4.10 of the RFP.	JBLM Forestry Management Section will work to dispose of stacked log decks during construction period. Timber sales and subsequent removal by 3rd parties of all or portions of the log decks may occur during the construction period.
Telecom Utilities	Provide connection from telecom manhole LC-000010 to TEMFs 1 & 2 as per the Plans	Provide Remote Switching Unit (RSU) Shed and telecom duct bank connections as per the Plans.	ISEC will provide switches to be installed in the RSU once the facility has been constructed.
Natural Gas Utilities	Coordinate with PSE for installation of building service connections and meter installation.	Coordinate with PSE for installation of building service connections and meter installation.	Puget Sound Energy (PSE) will be responsible for providing the extension of the gas main from near the intersection of Tacoma Drive and Prescott Avenue.
Water Utilities	Connect with new water main constructed by Warehouse Contractor at locations as indicated by the Plans.	Replace existing 16-inch AC water main which lies beneath both the Warehouse and TEMF portions of the site with 16-inch DI placed along the new Rainier Drive in accordance with the Plans. This replacement will be required prior to site grading in the zone above the old water main due to the poor condition of the old line.	Coordination with JBLM Water Section (Lyle Fogg- 253-966-1692) will be required prior to any work involving the Sparging Tower area and remediation system .
Electrical Utilities	TEMF Contractor will remove abandoned electrical aerial lines within project limits once the Warehouse Contractor has successfully completed new electrical feeder around the RLSC boundary.	Warehouse Contractor to construct new electrical feeder around the RLSC site and along Rainier Drive in accordance with the RFP. This task will occur ahead of demolition of the existing aerial power transmission lines cutting north-south across the site. This work shall be conducted prior to site grading in order to minimize the risk of power service outages and to prevent delay to the TEMF Contractor.	NA
Remediation Utilities	TEMF Contractor will utilize groundwater remediation system supply and return lines installed to the TEMF fencelines by the Warehouse Contractor. These lines will provide groundwater supply and return for use in the TEMF hydronic systems.	Warehouse Contractor will install two sets of groundwater supply and return lines near the existing Sparging Tower in accordance with the RFP. These lines will be placed to the TEMF fencelines for use by the TEMF Contractor for the TEMF hydronic systems. The groundwater remediation system can be down for new construction work for only five days at a time.	Coordination with JBLM Environmental Section (Jim Gillie- 253-966-1774) will be required prior to any work involving the Sparging Tower area and remediation system .
POV Parking	To be provided by the TEMF Contractor as per the Plans.	NA	NA
Fencing	TEMF Contractor will provide security fencing around TEMFs.	Warehouse Contractor will establish Temporary Cantonment Fencing per the Plans upon mobilization. The establishment of the Temporary Cantonment Fencing will allow both the Warehouse and TEMF contractors to enter the RLSC area via the Clover Park Technical College gate without having to go through the JBLM Logistics Gate. The Warehouse Contractor will also be responsible for providing Permanent Cantonment Fencing and security fencing in the vehicle storage areas as per the Plans.	JBLM Physical Security (David Horne- 253-966-0654) will be the approval authority of the Temporary Cantonment Fence prior to allowing the removal of the existing cantonment fence and use of the Clover Park Technical College gate for RLSC site access.
Roads	Upgrade intersection of Tacoma Drive and the new Rainier Drive alignment with concrete as per the Plans.	Construct new Rainier Drive alignment starting at the eastern edge of the intersection of Rainier Drive and Tacoma Drive as per the Plans. Enlarge intersection of Rainier Drive and A Street as per the RFP.	NA
Storm Water Utilities	TEMF Contractor will provide in accordance with the Plans.	Warehouse Contractor will design and build appropriate storm water systems throughout the areas of new construction.	NA
Sanitary Sewer Utilities	TEMF Contractor will provide in accordance with the Plans including a service stub for the Warehouse.	Warehouse Contractor will connect to sanitary service stub provided by the TEMF Contractor as per the Plans.	NA
Building Identification	TEMF Contractor will provide building identification signs for TEMFs 1 and 2, OSBs 1 and 2, and HAZMAT/Hazwaste Sheds 1 and 2. TEMF Contractor will provide building street signs for TEMFs 1 and 2 as well as the Warehouse in accordance with the TEMFs Plans.	Warehouse Contractor will provide building identification signs for the Warehouse and the new Guard Shack Building.	NA
Sustainability, LEED building/site interface	LEED Boundary will be based upon indicated construction limit for the TEMF project.	LEED Boundary will be based upon indicated construction limit for the Warehouse project.	NA
Contractor Laydown Yard	The area formerly occupied by the Clover Park Technical College Fort Lewis Campus can be co-used with the Warehouse Contractor. Otherwise, do not site laydown area outside of designated construction limits for the TEMF Contract.	The area formerly occupied by the Clover Park Technical College Fort Lewis Campus can be co-used with the TEMF Contractor. Otherwise, do not site laydown area outside of designated construction limits for the Warehouse Contract.	NA
Contractor Site Access	Main site access will be through the former Clover Park Technical College Campus gate located along Murray Drive SW. Develop construction access road along the existing gravel road next to the JBLM cantonment fence from the former Clover Park Technical College site to Rainier Drive in the vicinity of Tacoma Drive in accordance with the Plans.	Main site access will be through the former Clover Park Technical College Campus gate located along Murray Drive SW. Utilize existing road from the former Clover Park Technical College site to Rainier Drive in the vicinity of the historic Logistics Gate next to I-5 in accordance with the RFP.	NA
Contractor Trailer Yard	Contractor will establish a project trailer yard on the existing Rainier Drive road grade in vicinity of Rainier Drive and Tacoma Drive.	Contractor will establish a project trailer yard on the existing Rainier Drive road grade in the vicinity of the TACOM Yard.	Government Trailer will be located as a part of the Warehouse Contractor's Trailer Area
Building 9500 Equipment Yards	The TEMF Contractor will coordinate with the Warehouse Contractor and the occupants of the Building 9500 yards the timing of removal yard fencing and utilities. This removal will occur only after the Building 9500 equipment has been moved into the newly fenced yards east and south of Building 9500.	Contractor will coordinate with the occupants of the Building 9500 equipment yards to facilitate equipment moves. In order to allow the Building 9500 equipment to be moved from its present location north of Building 9500 to the east and south, the Warehouse Contractor will need to establish the new fencelines immediately upon mobilization. Once all Building 9500 equipment has been moved from the yards north of Building 9500, the Warehouse Contractor may proceed with activities north of Building 9500.	Building 9500 yard occupants will move their equipment into the new yards created by the Warehouse Contractor immediately following completion. The POC for this action will be Fred Tremaine (253) 966-9160, the Government Site Manager for CECOM Pacific Region.
Guard Shack Building	NA	Build Guard Shack Building as per the RFP. Guard Shack will be a top priority item in order to allow for the movement of materials from Buildings 9513 and 9508. Buildings 9508 and 9513 cannot be abated and demolished until the new Guard Shack Building has been built and certified for material storage. A Final Building Analysis of the Building 9513 and 9508 Materials Report will be available 1 NOV 11. This report will provide direction for the disposal of Buildings 9513 and 9508. If residual radioactivity levels are above levels for disposal in a Municipal Landfill, demolition of Buildings 9513 and 9508 will be conducted by the Warehouse Contractor and disposal will be coordinated and paid for the Government. If residual radioactivity levels are appropriate for disposal in a Municipal landfill, the Warehouse Contractor will handle demolition and disposal of Buildings 9513 and 9508 as per the Hazardous Building Materials Report in Appendix CC.	Technical POC for Guard Shack Building will be Thomas Dougherty, JBLM Safety Office (253)-967-6764.
Abatement and Demolition	NA	Abate, demolish, and dispose of Building 9004 and site features as specified in the Warehouse RFP. Abate, demolish, and dispose of Buildings 9508 and 9513 in accordance with the RFP, Appendix CC, and this Appendix. Buildings 9508 and 9513 cannot be abated and demolished until the new Guard Shack building has been built and certified for material storage.	NA

APPENDIX FF

Street Design Guidelines and Turning Radii

Street Standards: Design Guidelines

		Turning Radii Between Road Types (feet)													
		Tank Trail	Multiway Boulevard - 2 Access Lanes	Multiway Boulevard - 1 Access Lanes	Boulevard	Avenue	Parkway	District Street	Main Street	Neighborhood Street	Park Street	Alley	Parking Curb Cut (Truck)	Parking Curb Cut (Non-Truck)	
Hierarchy of Streets	Highest (Primary)	Tank Trail	50	50	50	50	50	50	50					50	10
		Multiway Boulevard - 2 Access Lanes	50	40	40	40	30	20	20	15	15	10	10	40	10
		Multiway Boulevard - 1 Access Lanes	50	40	40	40	30	20	20	15	15	10	10	40	10
		Boulevard	50	40	40	40	30	20	20	15	15	10	10	40	10
		Avenue	50	30	30	30	30	20	20	15	15	10	10	40	10
		Parkway	50	20	20	20	20	20	20	15	15	10	10	40	10
		District Street	50	20	20	20	20	20	20	15	15	10	10	40	10
		Main Street		15	15	15	15	15	15	15	15	10	10		10
		Neighborhood Street		15	15	15	15	15	15	15	15	10	10		10
		Park Street		10	10	10	10	10	10	10	10	10	10		10
		Alley		10	10	10	10	10	10	10	10	10	10		10
		Truck Access/Parking Curb Cut	50	40	40	40	40	40	40					40	10
		POV Parking Curb Cut	10	10	10	10	10	10	10	10	10	10	10	10	

Travel Lanes Width	Design Speed
10 feet	25 mph or below
11 feet	26 - 35 mph and truck routes
12 feet	Above 35 mph
14 feet	Tank Trails

Parallel Parking Lane Width	Design Speed
7 feet	25 mph or below
8 feet	Above 25 mph to 35 mph
9 feet	Above 35 mph

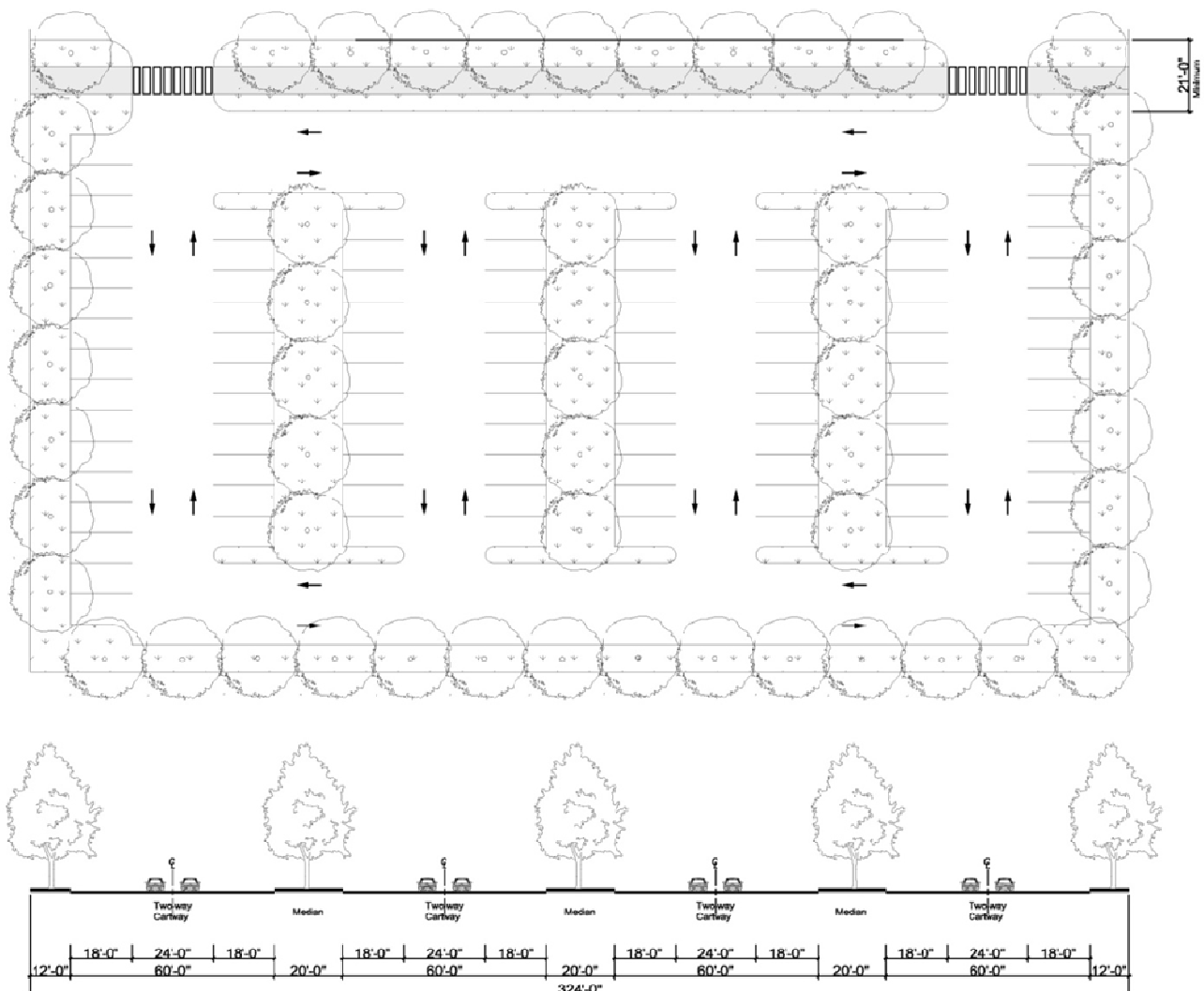
30° Angle Parking Lane Width	Design Speed
17.3 feet	25 mph or below

CAR PARK STANDARD

Car Park Description

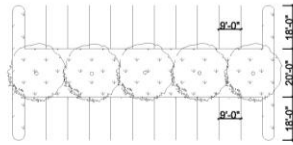
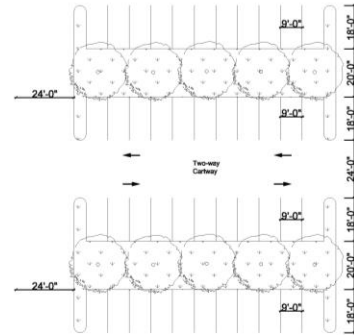
- Planted median(s) of trees, grasses and shrubs between every parking aisle that serves as bioretention/ infiltration for stormwater run-off from paved parking areas and other nearby impervious surfaces.
- Trees shall be planted such that 70% of the parking area will be shaded by a tree canopy in 15 years.
- Planted median(s) shall have temporary irrigation until plants are established.
- Tree, grass and shrub species shall be selected from the plant lists found in the "Low Impact Technical Guidance Manual for Puget Sound," available from http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf.
- Planted median(s) and paved parking areas shall be separated by a curb.
- Curbing shall allow drainage from the paved area to pass through it and into the landscaped areas.

Typical Car Park Site Plan:

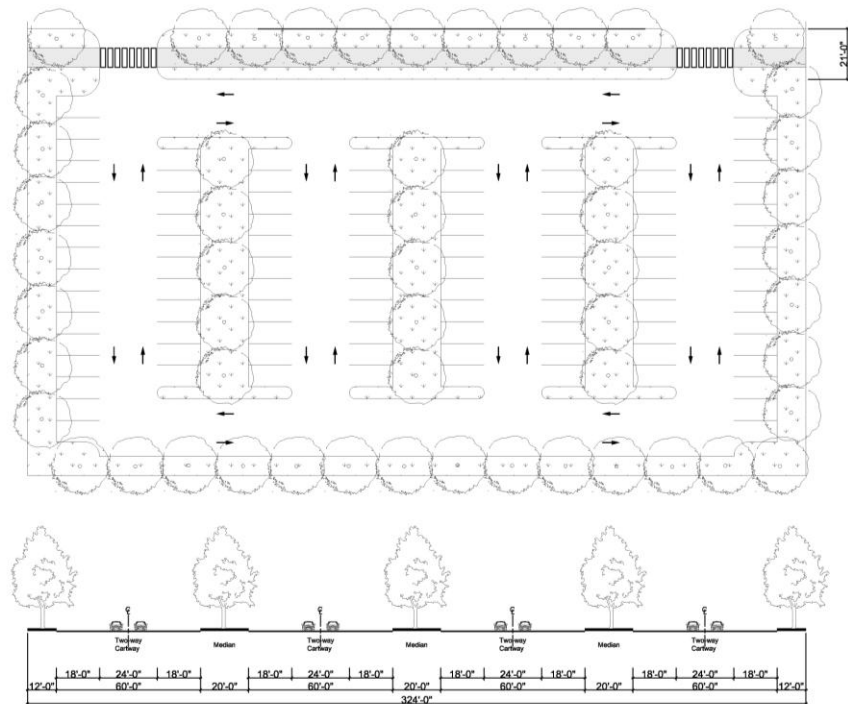


Street Standard | *Parking Park*

TYPICAL PARKING BAY

PARKING BAY ADJACENCIES
(repeat as necessary)

TYPICAL CAR PARK

**NOTE:**

1. Medians shall be landscaped with trees 20' to 30' on-center.
2. Medians shall be a minimum of 20' in width and extend the entire length of the parking aisle.
3. Medians shall act as swales with a depression of 18".
4. Cartways shall be 24' wide maximum.
5. Parkway area shall be set back a minimum 21' from road edge.
6. Parking spaces shall be 9' wide and 18' deep.
7. Any variation to parking design must be approved by Fort Lewis Public Works.



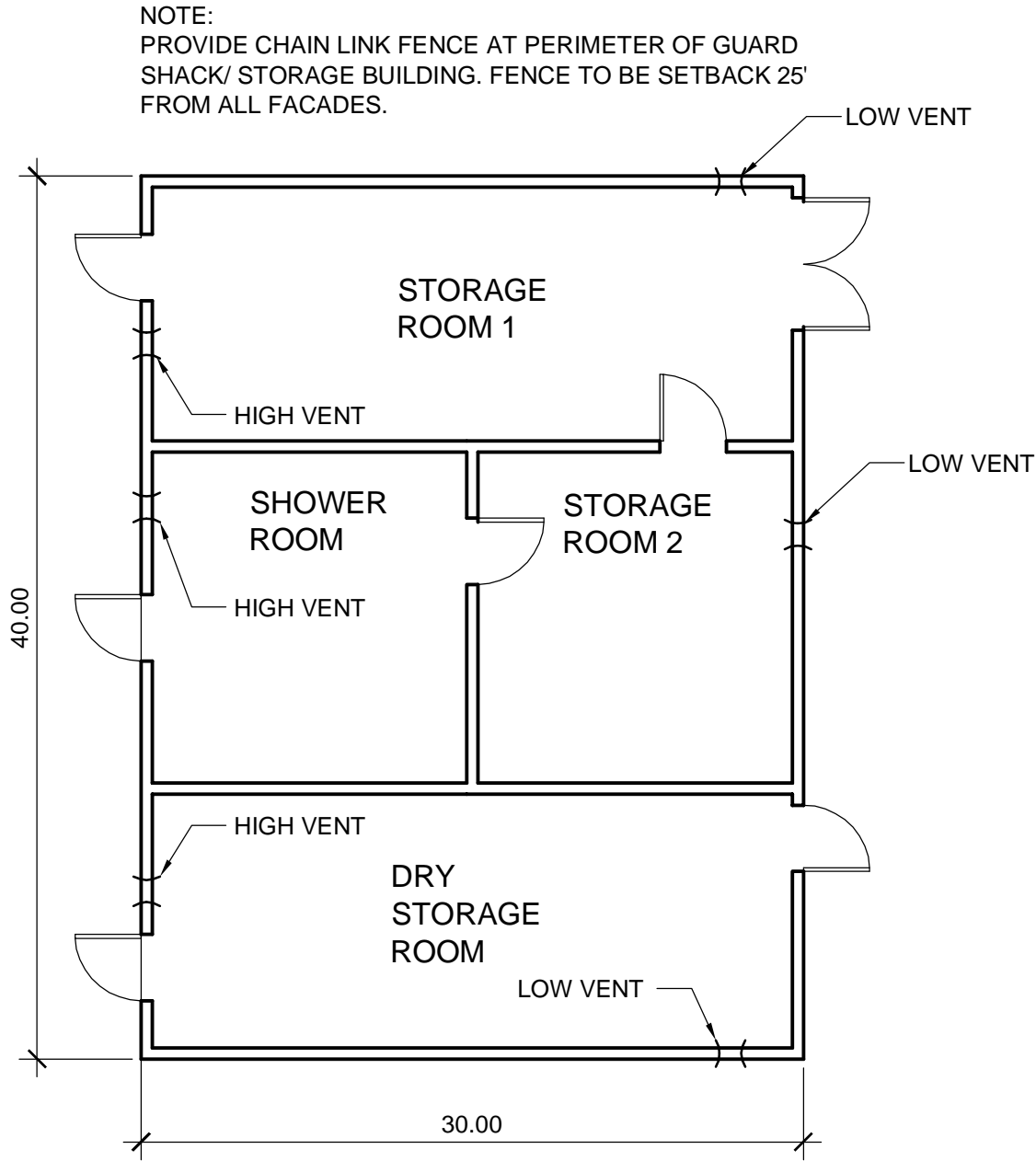
APPENDIX EE
PHOTOS OF EXISTING CAR PARKS

DESIGN FREEDOM: Photographs presented in this Appendix are intended to show the as-built car parks on Joint Base Lewis-McChord. These photographs are not intended to restrict the creative approach of the contractor's proposals, nor are they intended to constrain the selection of materials beyond the requirements stipulated in this RFP.





APPENDIX GG – Guard Shack/Storage Building Floor Plan



GUARD SHACK / STORAGE BUILDING FLOOR PLAN

**APPENDIX HH – Joint Base Lewis-McChord (JBLM) Oregon White Oak
Planting Plan**

Attachment for Joint Base Lewis-McChord Oregon White Oak Planting Plan

Plantings Location

All planting locations for oak mitigation will be down range within designated training areas as directed by the Contracting Officer and coordinated with the Public Works Fish & Wildlife staff.

Planting Density



Oak trees are to be planted in a random arrangement with a high density to account for natural mortality. The spacing can range from 8 to 15 feet.

Where to Get Oregon White Oak Seedlings

There are a number of commercial nurseries in Oregon, Washington and British Columbia that carry the Oregon White Oak (*Quercus garryana*). The tree stock to be purchased will be in one or two gallon containers. The minimum diameter of each oak at the base stem should be at least (1/4" inch or 6mm) in diameter.

When to Plant Oak Seedlings

Planting of Oregon White Oak will occur between November and March. It is recommended to plant in the fall when the first rains have soaked the soil and before the temperatures begin to warm in the early spring. Trees planted in the fall have a better chance at survival due to its roots getting established through the first summer.

Planting Techniques

Oregon White Oak trees will be planted using an auger to loosen the rocky prairie soils of the South Puget Sound.

Vegetation will be removed with a shovel or hand tool in a no more than 12 inch diameter of the planting hole. Augured holes will be several inches deeper and several inches wider than the tree root system.

For the potted trees that are root bound, prune off any portion of the taproot. If a circled taproot is planted, growth will be severely hampered.

The root collar (point where the taproot becomes stem) should be just below the ground level. Pack the soil firmly.

Planting Protection

All Oregon White Oak trees that are planted will receive a four inch layer of organic mulch that extends at least four feet in diameter from the seedling in all directions.

Once planted, Oregon White Oak trees will be protected with solid walled, blue tree shelters (Protex – Pro/Gro Solid Tube Tree Protectors or approved equal in strength and durability) that will be staked into the ground with bamboo stakes. These shelters protect seedlings from browse and burrowing rodents, as well as increase height growth rate.

**Planting Maintenance**

Oregon White Oak trees will be maintained and monitored for one year. During the first summer they will be watered appropriately to ensure survival. After one year of maintenance all dead Oregon White Oak trees will be replaced and replanted.

Identification of plants

Planted seedlings will have a distinctive color coding on the tube protectors which can be spray painted or ribboning. The color coding shall distinguish the plantings installed under this specific contract. In addition, stakes shall be driven (Minimum of three feet in height above ground at all corners of the planted areas. The stakes will have an attached legible tag or marker with the Contract Number, Contract Title and the Contractor's name .

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SECTION 01 14 10

SUPPLEMENTARY REQUIREMENTS FOR JOINT BASE LEWIS-MCCHORD

PART 1 GENERAL

1.1 DEFINITIONS

The work covered by this section of the specifications consists of work common to more than one section of these TECHNICAL SPECIFICATIONS.

"SUPPLEMENTARY REQUIREMENTS" shall be read to pertain to any of the sections of the DIVISION 1 as required by the content of the section or paragraph containing the reference.

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Training Plan; G;

SD-07 Certificates

Qualifications of the Trainer; G;

SD-10 Operation and Maintenance Data

AUDIO-VIDEO RECORDINGS; G;

1.3 PERMITS OBTAINED BY GOVERNMENT AND CONTRACTOR RESPONSIBILITIES

It will be the responsibility of the Contractor to obtain all other permits/licenses required for this project. See the Contract Clause Paragraph entitled PERMITS AND RESPONSIBILITIES.

1.4 PROTECTION OF GOVERNMENT PROPERTY

In addition to requirements of the CONTRACT CLAUSES, Contractor shall protect all Government property within the buildings in which he is working, except for such property as is required to be demolished. Property which is to be demolished shall be protected until its scheduled demolition time. Protection shall include, but not be limited to, protection from construction generated dust, debris, water, and vibration.

1.5 CORRESPONDENCE

1.5.1 Labeling Correspondences

All correspondence shall be addressed to the Administrative Contracting Officer, shall be serially numbered commencing with Number H-0001 for home office letters and S-0001 for site office letters, with no numbers missing or duplicated and shall be furnished with an original and one copy. Enclosures attached or transmitted with the correspondence shall also be furnished with an original and one copy. Each serial letter shall make reference to the contract name, contract number and shall have only one subject.

All correspondence from the Contracting Officer will be also serially numbered with no numbers missing or duplicated. Letters to the Contractor will be forwarded in duplicate.

In the event there is more than one project within a contract, correspondence shall contain separate and distinct submittals to identify each project by name.

1.5.2 Submission of Contractor Payment Requests

For submission of Contractor payment requests, See Section 01 22 00.10 MEASUREMENT AND PAYMENT.

1.6 ADVANCED NOTICE OF CONTRACTOR PERFORMED ACCEPTANCE TESTING

The Contractor shall notify the Contracting Officer a minimum of 20 days prior to performing any acceptance or "buy off" testing of the following systems when applicable: (1) EMCS, (2) Fire Detection/Protection, (3) Intrusion Detection System, (4) Uninterruptible Power Supply, (5) HVAC, (6) AFFF, and (7) Hydrant Refuel. Advance notification is not required for testing performed as part of fabrication or installation.

1.7 CONTRACTOR'S FILES

Contractor shall maintain "Approved" (Action Code "A") and "Approved Except as Noted" (Action Code "B") shop drawing files in fabrication shops and at

project sites for government use.

1.8 COMMERCIAL VEHICLE ACCESS TO JOINT BASE LEWIS-MCCHORD - REGISTERED AND PREVIOUSLY ID'D (RAPID) GATE PROGRAM

Procedures for commercial vehicle access to Joint Base Lewis-McChord are subject to change without prior notice. The following requirements apply.

- a. Unless the Contractor voluntarily participates in the RAPID Gate Program, commercial vehicle access to Joint Base Lewis-McChord will be allowed only at the Logistics Center Gate (Exit 123 from I-5) and through the D Street Commercial Vehicle Inspection Point on North Fort. Both gates are open Monday through Friday, excluding federal holidays. These gates will be open for inbound commercial vehicle access and inspection between 0530 hours and 2100 hours. These gates are closed on weekends (Saturdays and Sundays) and federal holidays. On Saturdays, Sundays and federal holidays, commercial vehicles must use the Main Gate (Exit 120 from I-5). Main Gate is open 24 hours per day everyday. A visitor pass must be obtained. All commercial vehicles will be searched. The Contractor should anticipate delays in getting commercial vehicles on post. The Contractor must also allow additional time for commercial vehicles to reach their destination by driving through Joint Base Lewis-McChord.
 - (1) If the commercial vehicle is carrying a load of cement concrete or hot asphalt concrete for delivery, the driver shall notify the gate guard as soon as possible and request that the vehicle be given priority for being searched; however, the Government does not guarantee that the vehicle will be given priority.
 - (2) On weekends large vehicles (needing greater than 12'-5" clearance) will require a time-stamped "searched" label to gain access to North Fort Lewis. "Searched" labels will be issued at the Main Gate, as appropriate. Drivers needing access to North Fort Lewis must inform the gate guard that their vehicle is over 12'-5" in height and that they will require access to North Fort Lewis. The driver will receive a briefing on proper procedures and a "searched" label. The Contractor shall ensure that its drivers, including drivers of Subcontractors at any tier, comply with the procedures as explained to them for access to North Fort Lewis.
- b. If the Contractor participates in the RAPID Gate Program, Contractor vehicles may enter the installation through any RAPID gate lane except at Force Protection Level Charlie or Delta. During Force Protection Level Charlie or Delta, all Contractor vehicles must enter through the Logistics Center gate or, if the Logistics Center Gate is closed, through the Main Gate. All passengers in the Contractor vehicle must have a RAPID identification card; otherwise, the Contractor vehicle must enter through the Logistics Center Gate or the Main Gate, as appropriate and obtain visitor passes. Once the RAPID Gate Program

is fully implemented, RAPID gate lanes will be at the Main (Liberty) Gate, the East Gate, the DuPont Gate, the D Street Gate, the Logistics Center Gate, the Madigan Army Medical Center Gate, and the North Fort Gate. The Contractor shall use only those lanes specifically marked as RAPID lanes.

1.9 IDENTIFICATION OF EMPLOYEES AND MILITARY REGULATIONS

1.9.1 Compliance with Regulations

The Contractor shall be responsible for compliance with all regulations and orders of the Commanding Officer of the Military Installation, respecting identification of employees, movements on installation, parking, truck entry, and all other military regulations which may affect the work.

1.9.2 Specific Requirement for Vehicle Registration

The Commanding Officer of Joint Base Lewis-McChord, Washington, has initiated the following specific requirement regarding vehicle registration for this contract:

- a. Contractors performing work on Joint Base Lewis-McChord shall, after award, register all vehicles to be used on the installation with the Vehicle Registration Section of the Law Enforcement Command. Contractor employees entering the installation in privately owned vehicles (POVs) shall also register their vehicles. A copy of contract award, proof of liability insurance, current driver's license and state vehicle registration shall be required to register Contractor, Subcontractor, and employee vehicles.
- b. Upon completion of the contract, it shall be the prime Contractor's responsibility to collect all vehicle decals issued under the contract including those issued to employees and Subcontractors. Decals are to be carefully removed from the vehicle, placed in an envelope and attached to the original documentation (i.e., post vehicle registration document) received with the decal. Decals, with documentation, must be returned to Vehicle Registration, Building 2140. Proof of decal clearance for all vehicles registered under this contract will be issued to the prime Contractor and shall be returned to the Contracting Officer prior to final payment.
- c. In the event of contract extension, it shall be the prime Contractor's responsibility to report time extension to Vehicle Registration, with evidence of same. For further information, contact Vehicle Registration at Waller Hall, Building 2140, Telephone: (253) 967-5065, Joint Base Lewis-McChord, Washington 98433-9500.

1.9.3 Employee Access and Identification

- a. Each employee who requires access to Joint Base Lewis-McChord to perform work under any contract, at any tier, must obtain either a RAPID identification badge or a visitor's pass to obtain access to Joint Base Lewis-McChord. A RAPID identification badge will only be issued to an employee, at any tier, if the employee requires access to Joint Base Lewis-McChord more than twice per week. Contractor employees, at any tier, who require access to Joint Base Lewis-McChord twice per week or less often or who do not participate in the RAPID Gate Program shall obtain a visitor's pass at the Main (Liberty) Gate, the Logistics Center Gate or the D Street Gate. The visitor's pass will be issued for a maximum of 30 days at a time. A RAPID identification badge will only be issued to Contractor employees if the Contractor participates in the RAPID Gate Program. The RAPID Gate Program is a voluntary program. The production of RAPID badges has been contracted out and the cost of the identification card shall be borne by the Contractor. Current established costs are: \$99 for company start-up and \$99 per individual.
- b. If an employee no longer needs an identification badge for any reason (e.g., quits his/her job or no longer performs work under the contract), the Contractor shall return the identification badge to Eid within two calendar days of such change. If the identification badge cannot be returned within the required time frame for any reason, the Contractor shall immediately notify both Eid and the Contracting Officer verbally, followed up in writing the next work day. An employee's inability to obtain entrance to a Government installation because he/she does not have the required identification badge or visitor's pass shall not excuse timely performance of the requirements of this contract. Eid or the Government may change the location at which identification badges are issued or returned, with or without advance notice to the Contractor. Any such changes shall not be a basis for adjusting the contract price under any clause of this contract.
- c. RAPID identification badges shall not be reproduced or copied by the Contractor, its Subcontractors, or their employees. If an employee's identification badge is lost, stolen, or reproduced, the Contractor shall verbally report the loss, theft, or reproduction to both Eid and the Contracting Officer on the day such loss, theft, or reproduction is discovered, followed by a written report of the circumstances to both Eid and the Contracting Officer within one calendar day after the loss, theft, or reproduction is discovered.
- d. Each Contractor employee shall wear the RAPID identification badge while performing work under the contract. The identification badge shall be worn on the upper front of the outer garment unless precluded by OSHA regulation(s). The identification badge shall not be used for access to any Government installation except for performance of work under the contract for which it was issued.
- e. The Contractor shall, upon expiration or termination of the contract, collect all identification badges and turn them in to Eid. The final invoice will not be

considered proper for purposes of the Prompt Payment Act (FAR 52.232-25 or FAR 52.212-4(i)) until all identification badges have been accounted for.

1.9.3.1 Issuance of RAPID Identification Badge

The Contractor shall provide information as required by Eid Passport, Inc. (Eid), to enable Eid to conduct a criminal history background check (CHBC) on Contractor employees who are to have access to Joint Base Lewis-McChord. The Contractor is responsible for paying Eid the fee per employee for conducting the CHBC and issuing the RAPID identification card. If the CHBC is not adverse, a RAPID identification badge will be issued by Eid to the Contractor employee. If the CHBC is adverse, Eid is prohibited from issuing a RAPID identification badge to the Contractor employee. If a RAPID identification badge is denied for any reason, the Contractor employee may only enter the installation by obtaining a visitor's pass; however, if the Contractor employee does not meet the criteria for being issued a RAPID identification badge, the Government may, in its sole discretion, decide not to issue a visitor's pass to the Contractor employee.

1.9.4 Compliance with Rules, Regulations, and Statutes

All Contractor employees shall observe and comply with all applicable local, State, and Federal rules, regulations, and statutes including those concerning fire, safety, sanitation, security, vehicle safety, and hazardous material handling.

1.9.5 Work Hours

Work hours in the construction area shall be restricted to 7:30 a.m. to 4:30 p.m. daily, Monday through Friday, excluding Federal holidays. Work hours other than as specified above shall be coordinated with and approved by the Contracting Officer.

1.9.6 Firearms

Contractor personnel while performing work under this contract shall carry no firearms.

1.9.7 Entrance Denial by Military Police

Contractor employees may be denied entry to the Installation by Military Police if it is determined that such entry may be contrary to good order, discipline, or the security of the Installation.

1.10 ADVANCED NOTICE OF CONTRACTOR PERFORMED ACCEPTANCE TESTING

The Contractor shall notify the Contracting Officer a minimum of 20 days prior to performing any acceptance or "buy off" testing of the following systems when

applicable: (1) EMCS, (2) Fire Detection/Protection, (3) Intrusion Detection System, (4) Uninterruptible Power Supply, (5) HVAC, (6) AFFF, and (7) Hydrant Refuel. Advance notification is not required for testing performed as part of fabrication or installation.

1.11 CONTRACTOR'S FILES

Contractor shall maintain "Approved" (Action Code "A") and "Approved Except as Noted" (Action Code "B") shop drawing files in fabrication shops and at project sites for government use.

1.12 AUDIO-VIDEO RECORDINGS

1.12.1 General

The Contractor shall provide all equipment, materials, and trained personnel to visually and audibly record (video record) all on site operations and maintenance (O&M) training sessions for this contract. The video technician shall be a video professional with a minimum of 2 years experience. The Contractor shall submit the resume of the technician and name and address of affiliated video production company, performing services, if applicable. Also the Contractor shall submit for approval an agenda or an outline breakdown of the proposed presentation. Videos shall be produced in the DVD format. Audio shall be adjusted, filtered or otherwise controlled to ensure that the trainer can be understood at all times. Each system or piece of equipment shall be covered in a single tape or set of tapes which shall be correlated with the O&M manuals provided. DVDs and their individual storage cases shall be identified with a typewritten label showing the project, equipment or system, and contract number; this same information shall be provided as an introduction on each DVD. When two or more DVDs are provided, they shall be submitted as a set in an appropriate storage container.

1.12.2 Submittals

Prior to conducting the training sessions the following shall be submitted for approval:

1. A training plan consisting of the agenda or an outline breakdown of the proposed presentation; and
2. The qualifications of the trainer and the video recording technician.

Two copies of the video taped material shall be submitted to the Contracting Officer within 10 days after completion of video taping the training sessions.

1.13 PROJECT PHOTOGRAPHS

1.13.1 General

The Contractor shall furnish digital photographs depicting construction as specified herein. The photographs shall be in digital JPEG format, with a resolution of 1024 x 768 pixels or better, size limited to less than 300KB. Photos shall be submitted in a Word document, with a caption under each photo showing date taken, project location, contract title and number, and a brief description of what the photo depicts. The photos shall be submitted on CD-ROM conforming to industry standards used in the United States.

1.13.2 Progress Photographs

Construction progress photographs shall be taken between the 1st and 15th of each month and delivered to the Contracting Officer with the payment request for the month taken. Photos shall be taken from ten positions.

Location of positions shall be coordinated with or may be selected by the Contracting Officer. They shall show, inasmuch as practicable, work accomplished during the previous month. Photographic quality and composition of photos shall be such that they can be used for briefings and/or to illustrate articles on the construction progress of the project.

1.13.3 Completion Photographs

Construction completion photographs are not required.

1.14 SPECIAL SCHEDULING REQUIREMENTS

- a. Have materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work.
- b. The existing CHPPM building will remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the activity.
- c. Permission to interrupt any activity roads, and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.
- d. The work under this contract requires special attention to the scheduling and conduct of the work in connection with existing operations. Identify on the construction schedule each factor which constitutes a potential interruption to operations.

The following conditions apply:

1. Contractor shall establish his laydown area within the construction and perimeter fences indicated on the drawings. Contractor shall not stage or store materials or equipment on base outside the construction fence.
2. Contractor shall secure his construction site and provide the Government use of the construction fence gates for emergency use to access the site.
3. Schedule work activities according to the phasing plans. Schedule work activities inside the existing building (including installation of temporary partitions) that will generate large amounts of noise, dust, and vibration within the existing facility outside regular work hours.

1.15 CONTRACTOR ACCESS AND USE OF PREMISES

1.15.1 Occupied and Existing Buildings

The Contractor shall be working in and around existing buildings which are occupied. Do not enter the buildings without prior approval of the Contracting Officer.

The existing buildings and their contents shall be kept secure at all times. Provide temporary closures as required to maintain security as directed by the Contracting Officer.

Provide dust covers or protective enclosures to protect existing work that remains and Government material located in the operational portion of the building during the construction period.

Relocate movable furniture as directed by the Contracting Officer away from the Contractor's working area as required to perform the work. Protect the furniture, and replace the furniture in their original locations upon completion of the work. Provide dust covers over all in-place furniture.

Leave attached equipment in place, and protect them against damage, or temporarily disconnect, relocate, protect, and reinstall at the completion of the work, or as directed otherwise.

1.15.2 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Fridays, Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."

- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Interruption to services, including but not limited to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, compressed air, and medical gases shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."
- d. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.
- e. The Contractor shall protect existing utilities and maintain adequate storm drainage of the construction site. Temporary interruptions or shutdown of any utility or electrical/communications/mechanical system shall be requested in writing from the Contracting Officer's Representative (COR) at least 14 calendar days in advance prior to the desired time. Under no circumstances shall any utility/system be interrupted without the written approval of the COR.

1.16 PRESERVATION OF HISTORICAL, ARCHEOLOGICAL AND CULTURAL RESOURCES (1985 JAN OCE)

If, during construction activities, the Contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.

1.17 COMPLIANCE WITH DAVIS-BACON ACT

1.17.1 Contractor POC

Within 14 days after award of the contract, the Contractor shall designate a point of contact (POC) within their organization who will be responsible for the Davis-Bacon Act Labor Program for the Contractor and all Subcontractors under this contract as required by the Contract Clauses and FAR 52.222.

1.17.2 Responsibilities

The designated Contractor POC shall be responsible for Davis-Bacon Act Labor Program activities including, but not limited to:

- a. Documentation and record keeping.
- b. Submittal and accuracy of certified payrolls.
- c. Submittal of required labor forms including requests for additional classifications and rates, Statements and Acknowledgement, etc.
- d. Posting of the wage determination, approved additional classifications and rates, labor and EEO posters.
- e. Coordination with the Contracting Officer's Labor Program POC.

Prior to submittal to the Government, payrolls shall be reviewed for compliance to all applicable labor standards, to include, but not be limited to the following items: correct wage rates, correct overtime classification and pay, misclassification of workers for work actually performed, apprentice to journeyman ratios, and registration of apprentice. Corrective actions shall be taken as necessary to ensure Contractor compliance with applicable contract and FAR clauses.

1.17.3 Certification

The Contractor POC shall provide a signed certification stating the following: "I certify that the submitted items being forwarded have been reviewed in detail and are correct and in strict conformance with the Labor Standards of the contract except as otherwise stated."

1.17.3.1 Base Design Standards

The Contractor shall ensure that this project is constructed in compliance with the following design standards:

- a. Fort Lewis Installation Design Guide (October 2007)
- b. Joint Base Lewis-McChord Guide to Green Procurement for Construction

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ECB 2005-10	(2005) Scheduling Requirements for Testing of Mechanical Systems in Construction
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ER 1-1-11	(1995) Progress, Schedules, and Network Analysis Systems
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1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preliminary Project Schedule; G RO

Initial Project Schedule; G RO

Periodic Schedule Updates; G RO

1.3 QUALITY ASSURANCE

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating (activity status) and preparation of reports. The authorized representative shall have previously developed, created, and maintained at least 2 electronic schedules for projects similar in nature and complexity to this project and shall be experienced in the use of the scheduling software that meets the requirements of this specification.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to the Contract Clause - SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project, including the design and construction sequences, is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool.

3.1.1 Approved Project Schedule

Use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. Make the schedule cost loaded and activity coded. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

3.1.2 Schedule Status Reports

Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

3.1.3 Default Terms

Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for a determination, by the Contracting Officer, that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 BASIS FOR PAYMENT AND COST LOADING

Use the schedule as the basis for determining contract earnings during each update period and therefore the amount of each progress payment. Lack of an approved schedule update, or qualified scheduling personnel, will result in the inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure of the Contractor to provide all required information will result in the disapproval of the preliminary, initial and subsequent schedule updates. In the event schedule revisions are directed by the Contracting Officer and those revisions have not been included in subsequent revisions or updates, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until such revisions to the Project Schedule have been made. Activity cost loading shall be reasonable, as determined by the Contracting Officer. The aggregate value of all activities coded to a contract CLIN shall equal the value of the CLIN on the Schedule.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

The computer software system utilized to produce and update the Project Schedule shall be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule.

3.3.1 Critical Path Method

Use the Critical Path Method (CPM) of network calculation to generate the Project Schedule. Prepare the Project Schedule using the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

Develop the Project Schedule to an appropriate level of detail. Failure to develop the Project Schedule to an appropriate level of detail, as determined by the Contracting Officer, will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2.1 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days. Procurement activities are defined herein.

3.3.2.2 Procurement Activities

The schedule must include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an

anticipated procurement sequence of over 90 calendar days. A typical procurement sequence includes the string of activities: submit, approve, procure, fabricate, and deliver.

3.3.2.3 Mandatory Tasks

The following tasks must be included and properly scheduled:

- a. Submission, review and acceptance of design packages.
- b. Submission of mechanical/electrical/information systems layout drawings.
- c. Submission and approval of O & M manuals.
- d. Submission and approval of as-built drawings.
- e. Submission and approval of 1354 data and installed equipment lists.
- f. Submission and approval of testing and air balance (TAB).
- g. Submission of TAB specialist design review report.
- h. Submission and approval of fire protection specialist.
- i. Submission and approval of testing and balancing of HVAC plus commissioning plans and data. Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with ECB 2005-10.
- j. Air and water balancing.
- k. HVAC commissioning.
- l. Controls testing plan submission.
- m. Controls testing.
- n. Performance Verification testing.
- o. Other systems testing, if required.
- p. Contractor's pre-final inspection.
- q. Correction of punchlist from Contractor's pre-final inspection.
- r. Government's pre-final inspection.

s. Correction of punch list from Government's pre-final inspection.

t. Final inspection.

3.3.2.4 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Activity Responsibility Coding (RESP)

Assign responsibility Code for all activities to the Prime Contractor, Subcontractor, or Government agency responsible for performing the activity. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Equipment (GFE), and Notice to Proceed (NTP) for phasing requirements. Code all activities not coded with a Government Responsibility Code to the Prime Contractor or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE). Unacceptable code values are abbreviations of the names of subcontractors.

3.3.2.6 Activity Work Area Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew, from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the activity is not resource or space constrained.

3.3.2.7 Contract Changes/Requests for Equitable Adjustment (REA) Coding (MODF)

Assign Activity code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by the Contracting Officer, with a Contract Changes/REA Code. Key all Code values to the Government's modification numbering system. Any activity or sequence of activities added to the schedule as a result of alleged constructive changes made by the Government may be added to a

copy of the current schedule, subject to the approval of the Contracting Officer. Assign Activity codes for these activities with a Contract Changes/REA Code. Key the code values to the Contractor's numbering system. Approval to add these activities does not necessarily mean the Government accepts responsibility and, therefore, liability for such activities and any associated impacts to the schedule, but rather the Government recognizes such activities are appropriately added to the schedule for the purposes of maintaining a realistic and meaningful schedule. Such activities shall not be Responsibility Coded to the Government unless approved. An activity shall not have more than one Contract Changes/REA Code.

3.3.2.8 Contract Line Item (CLIN) Coding (BIDI)

Code all activities to the CLIN on the Contract Line Item Schedule to which the activity belongs. An activity shall not contain more than one CLIN Item Code. CLIN Item code all activities, even when an activity is not cost loaded.

3.3.2.9 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities based upon the phase of work in which the activity occurs. Code activities to a Construction Phase. Code fast track construction phases proposed by the Contractor to allow filtering and organizing the schedule by fast track construction. If the contract specifies construction phasing with separately defined performance periods, identify a Construction Phase Code to allow filtering and organizing the schedule accordingly. Each activity shall be identified with a single project phase and have only one Phase of Work code.

3.3.2.10 Category of Work Coding (CATW)

Assign Category of Work Code to all Activities based upon the category of work to which the activity belongs. Category of Work Code must include, but is not limited to: construction submittal approvals, Acceptance, Procurement, Fabrication, Delivery, Weather Sensitive Installation, Non-Weather Sensitive Installation, Start-Up, Test and Turnover. Assign a Category of Work Code to each activity. Each activity shall have only one Category of Work Code.

3.3.2.11 Definable Features of Work Coding (FOW1, FOW2, FOW3)

Assign a Definable Feature of Work Code to appropriate activities based on the definable feature of work to which the activity belongs. Definable Feature of Work is defined in Specification Section 01 45 01 - USACE QUALITY CONTROL. An activity shall not have more than one Definable Feature of Work Code. Not all activities are required to be Definable Feature of Work Coded.

3.3.3 Scheduled Project Completion and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is received by the Contractor. Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7 day calendar when the contract assigns calendar day durations for the activity such as a Government Acceptance activity. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Assign the Category of Work Code - Weather Sensitive Installation - to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The Government will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the project schedule an activity called "Start Project" (or NTP). The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Schedule Constraints and Open Ended Logic

Constrain completion of the last activity in the schedule by the contract completion date. Schedule calculations shall result in a negative float when the calculated early finish date of the last activity is later than the contract completion date. Include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the contract completion date for the project, and with a zero day duration or by using the "project must finish by" date in the scheduling software. The schedule shall have no constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero free float" or "zero total float" are typically prohibited. There shall only be 2 open ended activities: Start Project (or NTP) with no predecessor logic and End Project with no successor logic.

3.3.3.3 Early Project Completion

In the event the Preliminary or Initial project schedule calculates an early completion date of the last activity prior to the contract completion date, the Contractor shall identify those activities that it intends to accelerate and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity shall have a late finish constraint equal to the contract completion date and the schedule will calculate positive float. The Government will not approve an early completion schedule with zero float on the longest path. The Government is under no

obligation to accelerate activities for which it is responsible to support a proposed early contract completion.

3.3.4 Interim Completion Dates

Constrain contractually specified interim completion dates to show negative float when the calculated early finish date of the last activity in that phase is later than the specified interim completion date.

3.3.4.1 Start Phase

Include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

Include as the last activity for a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the specified completion date for that phase and a zero day duration.

3.3.4.3 Phase "X" Hammock

Include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" hammock activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Do not automatically update Actual Start and Finish dates with default mechanisms that may be included in the scheduling software. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided from the Contractor Quality Control Reports (See Section 01 45 01). Failure of the Contractor to document the AS and AF dates on the Daily Contractor Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Contractor Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's updated schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Disable program features which calculate one of these parameters from the other.

3.3.6 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval, prior to submitting an updated project schedule. Correct out of sequence progress that continues for more than two update cycles by logic revision, as approved by the Contracting Officer.

3.3.7 Negative Lags and Start to Finish Relationships

Lag durations contained in the project schedule shall not have a negative value. Do not use Start to Finish (SF) relationships.

3.3.8 Calculation Mode

Schedule calculations shall retain the logic between predecessors and successors even when the successor activity starts and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") will not be allowed.

3.3.9 Milestones

The schedule must include milestone activities for each significant project event including but not limited to: milestone activities for each fast track design package released for construction; design complete; foundation/substructure construction complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD, reports, and network diagrams required for each submission are contained in Paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

Submit the Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 15 calendar days after the NTP is acknowledged. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. Detail it for the first 90 calendar days. It may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as previously specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must

include all of the required Plan and Program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 calendar days. Schedule any construction activities planned for the first 90 calendar days after NTP. Constrain planned construction activities by Government acceptance of the associated design package(s) and all other specified Program and Plan approvals. Activity code any activities that are summary in nature after the first 90 calendar days with Responsibility Code (RESP) and Feature of Work code (FOW1, FOW2, FOW3).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. The Initial Schedule shall be at a reasonable level of detail as determined by the Contracting Officer.

3.4.3 Design Package Schedule Submission

With each design package submitted to the Government, submit a frag-net schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.4 Periodic Schedule Updates

Based on the result of the meeting, specified in PERIODIC SCHEDULE UPDATE MEETINGS, submit periodic schedule updates. These submissions will enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.5 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. A template SDEF compatible schedule backup file (sdef.prx) is available on the QCS website: www.rmssupport.com. The SDEF format is as follows:

Field	Activity		
Code	Length	Description	

1	WRKP	3	Workers per Day
2	RESP	4	Responsible Party (e.g. GC, subcontractor, USACE)
3	AREA	4	Area of Work
4	MODF	6	Modification or REA number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of Work
7	CATW	1	Category of Work
8	FOW1	10	Feature of Work (used up to 10 characters in length)
9	FOW2	10	Feature of Work (used up to 20 characters in length)
10	FOW3	10	Feature of Work (used up to 30 characters in length)

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Data CD's

Provide two sets of data CD's containing the project schedule in the backup format. Each CD shall also contain all previous update backup files. File medium shall be CD. Label each CD indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule shall have a unique file name as determined by the Contractor.

3.5.2 Narrative Report

Provide a Narrative Report with the Preliminary, Initial, and each Periodic Update of the project schedule, as the basis of the progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths where the total float is less than or equal to 20 work days, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to communicate to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not.

3.5.3 Approved Changes Verification

Include only those project schedule changes in the schedule submission that have been previously approved by the Contracting Officer. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format, filtering, organizing and sorting for each schedule report shall be as directed by the Contracting Officer. Typically reports shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. The following lists typical reports that will be requested. One or all of these reports may be requested for each schedule submission.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.4.4 Earnings Report by CLIN

A compilation of the Contractor's Total Earnings on the project from the NTP to the data date. This report shall reflect the earnings of specific activities based on the agreements made in the schedule update meeting defined herein. Provided that the Contractor has furnished a complete schedule update, this report shall serve as the basis of determining progress payments. Group activities by CLIN item number and sort by activity number. This report shall: sum all activities coded to a particular CLIN and provide a CLIN item percent earned value; and complete and sum CLIN items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram is required for the Preliminary, Initial and Periodic Updates. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.5.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

Clearly show the critical path.

3.5.5.4 Banding

Organize activities as directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Meetings shall occur at least monthly within five days of the proposed schedule data date and after the Contractor has updated the schedule with Government concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intend to status. Provide a computer with the scheduling software loaded and a projector during the meeting which allows all meeting participants to view the proposed schedule update during the meeting. The meeting and resultant approvable schedule update shall be a condition precedent to a formal submission of the update, as described in paragraph SUBMISSION REQUIREMENTS, and to the submission of an invoice for payment. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity to review the updated schedule on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the Government. The meeting will last no longer than 8 hours. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the Government 48 hours in advance of the meeting. The Contractor's Project Manager and Authorized Scheduler

shall attend the meeting with the Authorized Representative of the Contracting Officer.

3.6.1 Update Submission Following Progress Meeting

Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments, pursuant to Paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the periodic schedule update meeting, reflecting only those changes made during the previous update meeting.

3.6.2 Status of Activities

Update information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete shall be subject to the approval of the Government prior to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting.

3.6.2.1 Start and Finish Dates

Accurately show the status of the AS and/or AF dates for each activity currently in-progress or completed since the last update. The Government may allow an AF date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign AS dates when actual progress occurs on an activity.

3.6.2.2 Remaining Duration

Update the estimated RD for all incomplete activities independent of Percent Complete. Remaining Durations may exceed the activity OD or may exceed the activity's prior update RD if the Government considers the current OD or RD to be understated based on current progress, insufficient work crews actually manning the job, unrealistic OD or deficiencies that must be corrected that restrain successor activities.

3.6.2.3 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete. To allow for proper schedule management, cost load the correction of punch list from Government pre-final inspection activity(ies) not less than 1 percent of the total contract value, which activity(ies) may be declared 100 percent complete upon completion and correction of all punch list work identified during Government pre-final inspection(s).

3.6.2.4 Logic Changes

Specifically identify and discuss all logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, Contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, and other changes that have been made pursuant to contract provisions. The Government will only approve logic revisions for the purpose of keeping the schedule valid in terms of its usefulness in calculating a realistic completion date, correcting erroneous logic ties, and accurately sequencing the work.

3.6.2.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather, 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary, 3) Changes required to correct a schedule that does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Contracting Officer: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of excusable delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is a condition precedent to any approvals by the Government. In response to each Request For Proposal issued by the Government, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Government impacts the critical path.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.2 Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the

NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

The Contracting Officer may request an interim update with revised activities for any requested time extension of over 2 weeks. Provide this CD within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The Contracting Officer will approve proposed revisions to the schedule prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 WEEKLY PROGRESS MEETINGS

- a. The Government and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings described in Paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as-planned progress and to review

planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Contracting Officer shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.

- b. Provide a bar chart produced by the scheduling software, organized by Total Float and Sorted by Early Start Date, and a two week "look-ahead" schedule by filtering all schedule activities to show only current ongoing activities and activities schedule to start during the upcoming two weeks, organized by Work Area Code (AREA) and sorted by Early Start Date.
- c. The Government and the Contractor shall jointly review the reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities), are not progressing satisfactorily and therefore could jeopardize timely project completion, corrective action must be taken immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Government responsibility coded activities require Government corrective action.

3.10 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Reference Section 01 45 01.10 - QUALITY CONTROL SYSTEM. The Contractor shall download and upload the schedule data into the Resident Management System (RMS) prior to RMS databases being transferred to the Government and is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and electronic export from QCS of the application for progress payment.

-- End of Section --

SECTION 01 35 26

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2005) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.22	(2005) Articulating Boom Cranes
ASME B30.3	(2004) Construction Tower Cranes
ASME B30.5	(2007) Mobile and Locomotive Cranes
ASME B30.8	(2004) Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2010) Standard for Portable Fire Extinguishers
NFPA 241	(2009) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B	(2008) Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2008) National Electrical Code
NFPA 70E	(2008) Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008; Change 1-2010; Change 3-2010; Errata 1-2010) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.500 Fall Protection

32 CFR 655 Radiation Sources on Army Land

WASHINGTON STATE ADMINISTRATIVE CODE (WAC)

WAC-296-155 Safety Standards for Construction Work

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

Government acceptance is required for submittals with a "G, A" designation.

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, A

Certificate of Compliance; G, A

Qualifications of Crane Operators; G, A

Radiation Permit Application (RPA); G

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Submit reports using the Excel Spreadsheet provided by the Government.

Monthly Exposure Reports

Submit reports using the Excel Spreadsheet provided by the Government.

Crane Reports

SD-07 Certificates

Work in Confined Spaces Permit

Hot work permit

1.3 DEFINITIONS

- a. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.
- b. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.
- c. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:
 - 1. Death, regardless of the time between the injury and death, or the length of the illness;
 - 2. Days away from work (any time lost after day of injury/illness onset);
 - 3. Restricted work;
 - 4. Transfer to another job;
 - 5. Medical treatment beyond first aid;
 - 6. Loss of consciousness; or
 - 7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in Numbers 1 through 6 above.

- d. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with USACE EM 385-1-1, and the following federal and state regulations: 29 CFR 1926 and WAC-296-155 (Washington State only) . EM 385-1-1 is available online at:<URL><http://www.usace.army.mil/CESO/Pages/EM385-1-1,2008NEW!.aspx></URL>. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.5 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

Provide a Site Safety and Health Officer (SSHO) at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall not be assigned to any other duties other than safety duties . Meet the following requirements within the SSHO:

Level 3:

A minimum of five years safety work on similar projects.

30-hour OSHA construction safety class or equivalent within the last five years.

An average of at least 24 hours of formal safety training each year for the past five years.

Competent person training as needed..

1.5.1.2 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. Submit proof of qualifications of crane operators.

1.5.2 Personnel Duties

1.5.2.1 Site Safety and Health Officer (SSHO)

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily quality control report.
- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPS and AHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to

correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

- d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site. Continuously reviewed and amended the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each preparatory control phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.8 DISPLAY OF SAFETY INFORMATION

Within one calendar day after commencement of work, erect a safety bulletin board at the job site. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include the following:

- a. Work in confined spaces permit.
- b. Hot work permit.

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References". Maintain applicable equipment manufacturer's manuals.

1.10 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.11 REPORTS

1.11.1 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.
- b. Conduct an accident investigation for any weight handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.
- c. For any injury resulting in a lost workday, not including the day of injury, or medical treatment, hospitalization the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 5 calendar day(s) of the accident.
- d. Preliminary Accident Notification worksheet (Attachment 01 35 26-C) shall be completed and returned to the COR no later than 16 hours after first notification of accident to SSHO.

1.11.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.11.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.11.4 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.11.5 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

1.12 HOT WORK

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fort Lewis Fire Prevention Branch. **CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED.** The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Reporting phone number. **ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE PROJECT OFFICE IMMEDIATELY.**

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems, welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, vaults, etc.) that have the potential for flammable or explosive atmospheres.

1.13 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

1.14 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

Comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

3.1.1 Radiation Permit Application (RPA)

A Radiation Permit is required to use, store, or possess ionizing radiation sources on Federal installations in accordance with 32 CFR 655. An RPA shall be reviewed by the Radiation Protection Officer (RPO) and approved via the Contracting Officer. Contractor shall remove all permitted sources from installation by the end of the permitted period. RPA shall specify start and stop dates for the Radiation Permit and describe the intended use of the radioactive material. For sealed sources, an affirmation that leak test requirements are current shall be included in the RPA. The RPA shall provide the following evidence that allow use of the source as specified in the RPA:

- a. A state radioactive material license (issued by the state in which the installation is located);
- b. An out-of-state license with host-state reciprocity. The Contractor establishes reciprocity by notifying the host state radioactive materials licensing authority before work commences, and complying with host state reciprocity requirements;
- c. An NRC license with host state reciprocity. The Contractor establishes reciprocity by notifying the host state radioactive materials licensing authority before work commences, and complying with host state reciprocity requirements; or
- d. A DOE radiological work permit (for work performed under DOE regulations).

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer and the Installation representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Contractor shall ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

Contracting Officer will, at the Contractor's request, apply lockout/tagout tags and take other actions that, because of experience and knowledge, are known to be necessary to make the particular equipment safe to work on for government owned and operated systems.

No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tagout tag attached to it, nor shall such tag be removed except as provided in this section. No person shall work on any energized equipment including, but not limited to activities such as erecting, installing, constructing, repairing, adjusting, inspecting, un-jamming, setting up, trouble shooting, testing, cleaning, dismantling, servicing and maintaining machines equipment of processes until an evaluation has been conducted identifying the energy source and the procedures which will be taken to ensure the safety of personnel.

When work is to be performed on electrical circuits, only qualified personnel shall perform work on electrical circuits.

A supervisor who is required to enter an area protected by a lockout/tagout tag will be considered a member of the protected group provided he notifies the holder of the tag stub each time he enters and departs from the protected area.

Identification markings on building light and power distribution circuits shall not be relied on for established safe work conditions.

Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

Pressurized or vacuum systems shall be vented to relieve differential pressure completely.

Vent valves shall be tagged open during the course of the work.

Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas shall be purged, ventilated, or otherwise made safe prior to entry.

3.3.1 Tag Placement

Lockout/tagout tags shall be completed in accordance with the regulations printed on the back thereof and attached to any device which, if operated, could cause an unsafe condition to exist.

If more than one group is to work on any circuit or equipment, the employee in charge of each group shall have a separate set of lockout/tagout tags completed and properly attached.

When it is required that certain equipment be tagged, the Government will review the characteristics of the various systems involved that affect the safety of the operations and the work to be done; take the necessary actions, including voltage and pressure checks, grounding, and venting, to make the system and equipment safe to work on; and apply such lockout/tagout tags to those switches, valves, vents, or other mechanical devices needed to preserve the safety provided. This operation is referred to as "Providing Safety Clearance."

3.3.2 Tag Removal

When any individual or group has completed its part of the work and is clear of the circuits or equipment, the supervisor, project leader, or individual for whom the equipment was tagged shall turn in his signed lockout/tagout tag stub to the Contracting Officer. That group's or individual's lockout/tagout tags on equipment may then be removed on authorization by the Contracting Officer.

3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards in accordance with EM 385-1-1. Within the program include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with USACE EM 385-1-1, section 21.A.16.

3.4.2 Fall Protection Equipment and Systems

In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, Paragraphs 21.N through 21.N.04. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase or if the manufacturer provides a hardened point for tying off. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel.

3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

1. For work within 6 feet of an edge, on low-slope roofs, protect personnel from falling by use of personal fall arrest systems, guardrails, or safety nets.

2. For work greater than 1.8 m (6 feet) from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

- b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.4.4 Existing Anchorage

Certified (or re-certified) by a qualified person for fall protection existing anchorages, to be used for attachment of personal fall arrest equipment in accordance with ASSE/SAFE Z359.1. Existing horizontal lifeline anchorages must be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

3.4.5 Horizontal Lifelines

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.4.6 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

3.4.7 Rescue and Evacuation Procedures

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

3.5 EQUIPMENT

3.5.1 Material Handling Equipment

- a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.
- c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.5.2 Weight Handling Equipment

- a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.
- b. Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- c. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- d. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.
- e. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11 and ASME B30.5 or ASME B30.22 as applicable.
- f. Do not crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane.
- g. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- h. All employees must keep clear of loads about to be lifted and of suspended loads.
- i. Use cribbing when performing lifts on outriggers.
- j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- k. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

- l. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.
- m. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
- n. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.6 EXCAVATIONS

Perform soil classification by a competent person in accordance with 29 CFR 1926.

3.6.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.6.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 2 feet of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility expose the utility by hand digging every 30.5m (100 feet) if parallel within 1.5m (5 feet) of the excavation.

3.6.3 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding must have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.6.4 Trenching Machinery

Operate trenching machines with digging chain drives only when the spotters/laborers are in plain view of the operator. Provide operator and spotters/laborers training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Keep documentation of the training on file at the project site.

3.7 UTILITIES WITHIN CONCRETE SLABS

Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

3.8 ELECTRICAL

3.8.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers will be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

3.8.2 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all

damaged extension cords. Portable extension cords shall meet the requirements of NFPA 70.

3.9 WORK IN CONFINED SPACES PERMIT

Comply with the requirements in Section 06.I of USACE EM 385-1-1, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b)(6). Any potential for a hazard in the confined space requires a permit system to be used.

-- End of Section --

SECTION 01 45 01.10

CONTRACTOR QUALITY CONTROL SYSTEM (QCS)

PART 1 GENERAL

1.1 CONTRACT ADMINISTRATION

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor must use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site: <http://www.rmssupport.com>. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- a. Administration
- b. Finances
- c. Quality Control
- d. Submittal Monitoring
- e. Scheduling
- f. Import/Export of Data
- g. Request for Information
- h. Accident Reporting
- i. Safety Exposure Manhours

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record will also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10 PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 01

CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith will be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.3 SYSTEM REQUIREMENTS

The following is the minimum system configuration that the Contractor must have to run QCS:

QCS and QAS System

Hardware

IBM-compatible PC with 1000 MHz Pentium or higher processor

256+ MB RAM for workstation / 512+ MB RAM for server

1 GB hard drive disk space for sole use by the QCS system

Compact Disk (CD) Reader 8x speed or higher

SVGA or higher resolution monitor (1024x768, 256 colors)

Mouse or other pointing device

Windows compatible printer. (Laser printer must have 4 MB+ of RAM)

Connection to the Internet, minimum 56k BPS

Software

MS Windows 2000 or higher

QAS-Word Processing software: MS Word 2000 or newer

Latest version of: Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher

Electronic mail (E-mail) MAPI compatible

Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, download instructions for the installation and use of QCS from the Government RMS Internet Website. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory "Construction Quality Management for Contractors" training class.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by using the Government's SFTP repository built into QCS import/export function. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

Establish, maintain, and update data in the QCS database throughout the duration of the contract at the Contractor's site office. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc.) using the Government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, e-mail or CD-ROM may be used instead (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically includes current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, deliver Contractor administrative data in electronic format.

1.6.1.2 Subcontractor Information

Contain within the database the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, deliver subcontractor administrative data in electronic format.

1.6.1.3 Correspondence

Refer to Section 01 14 10 SUPPLEMENTARY REQUIREMENTS FOR JOINT BASE LEWIS-MCCHORD, paragraph CORRESPONDENCE.

1.6.1.4 Equipment

Contain within the Contractor's QCS database a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.6.1.6 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in QCS.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Include within the QCS database a list of pay activities that the Contractor must develop in conjunction with the construction schedule. The sum of all pay activities must be equal to the total contract amount, including modifications. Group pay

activities Contract Line Item Number (CLIN); the sum of the activities must equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 Payment Requests

Prepare all progress payment requests using QCS. Complete the payment request worksheet, prompt payment certification, and payment invoice in QCS. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using QCS. Submit the payment request, prompt payment certification, and payment invoice with supporting data using the Government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, e-mail or a CD-ROM may be used. A signed paper copy of the approved payment request is also required, which will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 01 CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, submit a QCS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS must be the Contractor's official report. Summarize data from any supplemental reports by the Contractor and consolidate onto the QCS-generated Daily CQC Report. Submit daily CQC Reports as required by Section 01 45 01 CONTRACTOR QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the daily CQC report.

1.6.3.2 Deficiency Tracking

Use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. Maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

1.6.3.3 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in QCS. Update all data on these QC requirements as work progresses, and promptly provide this information to the Government via QCS.

1.6.3.4 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.5 Labor and Equipment Hours

Log labor and equipment exposure hours on a daily basis. This data will be rolled up into a monthly exposure report.

1.6.3.6 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. Regularly update the correction status of the safety comments. In addition, utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

1.6.3.7 Features of Work

Include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of Paragraph "Finances") will only be linked to a single feature of work.

1.6.3.8 Hazard Analysis

Use QCS to develop a hazard analysis for each feature of work included in the CQC Plan. Address any hazards, or potential hazards, that may be associated with the work.

1.6.4 Submittal Management

The Government will provide the initial submittal register in electronic format. Thereafter, maintain a complete list of all submittals, including completion of all data

columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. Use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update must be produced using QCS. QCS and RMS will be used to update, store and exchange electronic forms of the submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10 - PROJECT SCHEDULE. Input and maintain in the QCS database this schedule either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 - PROJECT SCHEDULE). Include with each pay request the updated schedule.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA CD-ROM

The Government-preferred method for Contractor's submission of QCS data is by using the Government's SFTP repository built into QCS export function. Other data should be submitted using E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of CD-ROM for data transfer. Export data onto CDs using the QCS built-in export function. If used, submit CD-ROMs in accordance with the following:

1.8.1 File Medium

Submit in English required data on CD-ROM conforming to industry standards used in the United States.

1.8.2 CD-ROM Labels

Affix a permanent exterior label to each CD-ROM submitted. Indicate on the label in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.8.3 File Names

The files will be automatically named by the QCS software. The naming convention established by the QCS software must not be altered.

1.9 MONTHLY COORDINATION MEETING

Update the QCS database each workday. At least monthly, generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, meet with the Government representative to review the planned progress payment data submission for errors and omissions.

Make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests that are accompanied by incomplete or incorrect data will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 57 20.00 10 ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY (DA)

AR 200-1 Environmental Protection and Enhancement

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008) Safety and Health Requirements
Manual
WETLAND MANUAL Corps of Engineers Wetlands Delineation
Manual Technical Report Y-87-1

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328 Definitions of Waters of the United States
40 CFR 260 Hazardous Waste Management System: General
40 CFR 261 Identification and Listing of Hazardous
Waste
40 CFR 262 Standards Applicable to Generators of
Hazardous Waste
40 CFR 279 Standards for the Management of Used Oil
40 CFR 302 Designation, Reportable Quantities, and
Notification
40 CFR 355 Emergency Planning and Notification
40 CFR 68 Chemical Accident Prevention Provisions
49 CFR 171 - 178 Hazardous Materials Regulations

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Land Application must be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.7 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.8 Wetlands

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

The Fort Lewis PW Environmental Management System (EMS) outlines procedures and provides guidance that addresses the operation, maintenance, support, and repair of facilities and infrastructure at Fort Lewis.

1.4 SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section must be included in the contract price.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in

accordance with Section 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G, EC-TB-ET, PNM-PL-ER, FL-PW-ED

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, submit an Environmental Protection Plan (EPP) for review and approval by the Contracting Officer. Send a copy of the EPP to Fort Lewis Directorate of Public Works, Environmental Division. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan must be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

Include in the environmental protection plan, but not limit it to, the following.

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the

Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan must include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. Include in the spill control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The spill control plan supplements the requirements of EM 385-1-1 and AR 200-1. Include in this plan, as a minimum.

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer and JBLM Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.
 3. Training requirements for Contractor's personnel and methods of accomplishing the training.
 4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
 5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
 6. The methods and procedures to be used for expeditious contaminant cleanup.
- k. A nonhazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.
1. Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.
 2. Evidence of the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. Attach a copy of each of the Nonhazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that nonhazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).
 3. Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.
 4. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

o. A wastewater management plan that identifies the methods and procedures for management and/or discharge of wastewaters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan must include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the wastewater, the plan must include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the wastewater. If disposal is to a sanitary sewer, the plan must include documentation that the Wastewater Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

1.7.3 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.

Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. Immediately following the survey, the Contractor will prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report will be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor must protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract.

1.9 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed in FL 200-1.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings, plans and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory

corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

Obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations is the Contractor's responsibility. Permitted work shall be in accordance with the associated permit. Copies of the permits shall be submitted to the Contracting Officer and Fort Lewis Public Works (ED) and must be in sufficient time to allow for review and revision with ultimate submittal at least 10 days before NTP for the associated permitted activity. Copies of permit amendments shall also be provided to the Contracting Officer and PW-ED. The Contractor shall be responsible for determining fee basis and paying all filing fees. All permit applications must indicate the following address as the building owner:

Ft. Lewis Public Works
ATTN: IMNW-LEW-PWE MS17
Box 339500 (BLDG. 2012)
Fort Lewis, WA 98433-9500

3.2 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas.

3.2.1 Work Area Limits

Mark the areas that need not be disturbed under this contract prior to

commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. The Contractor's personnel must be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved must be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. Construct or install temporary and permanent erosion and sediment control with best management practices (BMPs) as specified in Section 01 57 23 - TEMPORARY STORM WATER POLLUTION CONTROL. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. The Contractor's best management practices must also be in accordance with the National Pollutant Discharge Elimination System (NPDES) Ft. Lewis Construction General Permit and the Washington State Department of Ecology's Storm Water Management Manual for Western Washington. Remove any temporary measures after the area has been stabilized.

Permanent erosion and sediment control treatment facilities, such as biofiltration swales, rain gardens and infiltration basins, shall be constructed as shown on the drawings. Drainage to the permanent treatment facilities shall not be allowed during construction unless it complies with the SMMWW. Requirements of the SMMWW include diversion of runoff during construction from the permanent treatment facilities or if construction runoff is allowed to drain towards permanent treatment facilities then initial excavation shall not be closer than 1 foot of final elevation of permanent treatment facilities and final excavation to final grade shall not be allowed until after all disturbed areas upgradient have been permanently stabilized.

3.2.4 Lead-contaminated soil

Lead contamination is present in the topsoil in the approximate locations identified on Civil Drawing SITE-CD101. This contamination is from the uncontained demolition of buildings containing lead-based paint. The contamination is assumed to be classified as non-hazardous per EPA hazardous waste regulations. Where designated on Plate, SITE-CD101, remove the top 6 inches of soil and segregate/stockpile and sample the soil for both total lead and TCLP lead. If it is found to be non-hazardous lead contaminated soil (total lead greater than 250 mg/kg, and TCLP lead less than 5 mg/L), re-use on-site as fill where appropriate or deliver to a designated location on Fort Lewis per the Contracting Officer. Designated location will be within 15 miles of the project site.

If soil is re-used on site, it must be at 6 inches or more below grade. Adhere to all federal, state, and local standards and regulations pertaining to this removal. In areas within a critical root zone of an existing tree, remove the soil to a depth of 3 inches. The outermost limits of the critical root zone shall be marked on the ground with spray paint to accurately define the area.

If total lead results are less than 250 mg/kg, and TCLP lead is less than 5 mg/L then examine soil for paint chips. If soil is contaminated with paint chips, it may only be used below grade as described for soil re-use in previous paragraph (6 inches or more below grade), or must be removed to a location designated by the Contracting Officer. If there are no paint chips, and soil is less than 250 mg/kg and TCLP lead is less than 5 mg/L, then there is no environmental restriction for site re-use, as appropriate. Contact the Contracting Officer if sampling analysis during removal indicates hazardous levels of lead contamination (TCLP lead greater than 5 mg/L)

3.2.5 Possible petroleum-contaminated soil

Subsurface soil near former buildings B0910 (NW corner of 6th & F streets) and B0510 (NW corner of 1st & F streets) may contain petroleum-contaminated soil (PCS) deeper than 7 feet below-ground surface. Contact the Contracting Officer if PCS is encountered during excavation in either of these areas.

3.2.6 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities will be made only when approved. Erosion and sediment controls

must be provided for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas must be controlled to protect adjacent areas.

3.3 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3.2 Monitoring Wells

Monitoring wells may be encountered during construction activities. Any monitoring wells encountered during construction activities shall be protected against damage. If any monitoring well is damaged in any way, it shall be repaired at the Contractor's expense. Contact the Contracting Officer if a monitoring well is encountered.

3.4 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal, State, and local air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area.

Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities must be controlled at all times. The odors must be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

3.4.3 Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Washington rules.

3.4.4 Burning

Burning will not be allowed on the project site unless specified in other sections of the specifications or authorized in writing by the Contracting Officer. The specific time, location, and manner of burning will be subject to approval. Burning must completely reduce the materials to ashes.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes will be as directed below, unless otherwise specified in other sections and/or shown on the drawings. The Contractor is subject to all provisions of FL 200-1 and WAC 173-303. All material removed from Fort Lewis whether for reuse, disposal to a landfill or sent to a recycling facility, must be reported to the Pollution Prevention Office. Information must include amounts, types of material, and destination facility. POC for reporting is Ms. Stacy Randall (253)966-6470.

3.5.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and

licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262 in accordance with the Installation hazardous waste management plan. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer and the Facility Environmental Office. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility. Coordinate the disposition of hazardous waste with the Installation Hazardous Waste Manager and the Contracting Officer.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles must be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded must be stored in marked

corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site is not allowed. Fuel must be brought to the project site each day that work is performed. Storage of fuel on the project site will be in accordance with all Federal, State, and local laws and regulations and FL200-1.

3.5.5 Wastewater

Disposal of wastewater will be as specified below.

a. Wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc., will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related wastewater off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.

b. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing will be discharged into the sanitary sewer with prior approval and/or notification to the Wastewater Treatment Plant's Operator.

3.6 RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

At least 50% of the project's non-hazardous construction and demolition debris shall be recycled and/or salvaged.

3.7 NONHAZARDOUS SOLID WASTE DIVERSION REPORT

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to PW-ED through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report.

a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract. If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.9 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

3.10 OTHER ENVIRONMENTAL ISSUES

Other environmental issues (i.e., random underground storage tanks, transit piping, random transformer, etc.) may be encountered during construction activities. Contact the Contracting Officer if an environmental issue is encountered.

3.10.1 Cement Asbestos Pipe

Disconnect and abandon in place existing cement asbestos pipe. Abandoned

asbestos-cement lines shall be removed in locations where they fall under building footprints.

3.11 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor through the Contracting Officer, must coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time. Discuss integrated pest management strategies with the IPMC. Installation Project Office Pest Management personnel will be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control.

3.12 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.13 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.14 EMERGENCY UNEXPLODED ORDNANCE (UXO) RESPONSE

In the event that UXO, as defined in 40 CFR 260, is encountered during construction activities that are deemed to be a threat to human health or the environment, Ft. Lewis Military Police and EOD professionals shall be immediately contacted to conduct an emergency response. Additionally, immediately contact the Contracting Officer if UXO is encountered. Construction contractor personnel should stop work in the immediate vicinity of the discovery and maintain a safe distance from the item. Construction contractor should maintain flexibility in redirecting personnel and work effort in the event that items possessing an explosive hazard are discovered and construction personnel are excluded from areas during the destruction/removal process. An evaluation of this scenario and procedures, with contact numbers, shall be included in the health and safety plan (HASP) for the fieldwork.

3.15 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel must be trained in all phases of environmental protection and pollution control. Conduct environmental

protection/pollution control meetings for all personnel prior to commencing construction activities. Additional meetings must be conducted for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.16 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

1.0 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4439	(2004) Geosynthetics
ASTM D 4491	(1999a; R 2004) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(2004) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 2003) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(2002) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 GENERAL

The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION, and Section 01 10 00 STATEMENT OF WORK, Paragraph 6.3.3.1.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit;

Certificate attesting that the Contractor has met all specified requirements.

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4 STABILIZATION PRACTICES

The stabilization practices to be implemented shall include shall be selected from Washington State Department of Ecology's Stormwater Management Manual for Western Washington Best Management Practices (BMPs). On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, stabilization practices shall be initiated as soon as practicable, but no more than 14 days, in any portion of the site where construction activities have temporarily or permanently ceased.

1.4.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the snow cover or frozen ground, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.4.2 No Activity for Less Than 21 Days

Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the fourteenth day after construction activity temporarily ceased. Except where stabilization is precluded by snow cover or frozen ground, or construction on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 14 days, stabilization measures must be initiated as soon as practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

1.4.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff.

Structural practices shall include the following devices, when allowed by the Washington State Storm Water Management Manual.

1.5 SILT FENCES

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed after approval by the Contracting Officer. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

1.6 STRAW BALES

The Contractor shall provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. Bales shall be properly placed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in a area between a ridge and drain, bales shall be placed as work progresses, bales shall be removed/replaced/relocated as needed for work to progress in the drainage area). Areas where straw bales are to be used are shown on the drawings. Final removal of straw bale barriers shall be upon approval by the Contracting Officer. Rows of bales of straw shall be provided as follows:

- a. Along the downhill perimeter edge of all areas disturbed.
- b. Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.
- c. Along the toe of all cut slopes and fill slopes of the construction areas.
- d. Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc. that traverse disturbed areas or carry runoff from disturbed areas. Rows spacing shall be approved by the Contracting Officer.
- e. Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales. Rows spacing shall be approved by the Contracting Officer.
- f. At the entrance to culverts that receive runoff from disturbed areas.
- g. Any other location directed by Contracting Officer.

2.0 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE		
PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Elongation (%)	ASTM D 4632	100 lbs. min. 30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

2.2 COMPONENTS FOR STRAW BALES

The straw in the bales shall be stalks from oats, wheat, rye, barley, rice, or from grasses such as Byhalia, Bermuda, etc., furnished in air dry condition. The bales shall have a standard cross section of 14 inches by 18 inches. All bales shall be either wire-bound or string-tied. The Contractor may use either wooden stakes or steel posts to secure the straw bales to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimension of 2 inches x 2 inches in cross section and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 3 feet.

3.0 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 INSTALLATION OF STRAW BALES

Straw bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier. Loose straw shall be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Each bale shall be securely anchored by at least two stakes driven through the bale. The first stake or steel post in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel

pickets shall be driven a minimum 18 inches deep into the ground to securely anchor the bales.

3.3 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.3.1 Silt Fence Maintenance

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade.

3.3.2 Straw Bale Maintenance

Straw bale barriers shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier. Bale rows used to retain sediment shall be turned uphill at each end of each row. When a straw bale barrier is no longer required, it shall be removed. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade.

3.3.3 Diversion Dike Maintenance

Diversions dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade.

3.4 INSPECTIONS

3.4.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days OR at least once every (fourteen) 14 calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.4.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.4.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. A copy of the inspection report shall be maintained on the job site.

3.4.4 Monthly Inspection Report and Certification Form for Erosion and Sediment Controls

On the first working day of each month the Contractor shall complete, sign, and submit the original form to the State of Washington, Department of Ecology. On the first working day of each month the Contractor shall also furnish one copy of the form submitted to the Dept of Ecology, to the Contracting Officer as part of the Contractor's daily CQC Report and attach a copy of the completed form to the Plan. Unless otherwise notified by the Dept of Ecology, the Contractor shall submit the Monthly Inspection Report and Certification Forms for an additional two months after the final completion of all storm water pollution prevention measures required in this contract have been implemented.

End of Section

SECTION 01 62 35

RECYCLED / RECOVERED MATERIALS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247

Comprehensive Procurement Guideline for
Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 70 30

WARRANTY OF CONSTRUCTION

PART 1 GENERAL

1.1 SUBMITTALS

Submit the following in accordance with Section 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Warranty Management Plan; G

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, e-mail address and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags; G

Two record copies of the warranty tags showing the layout and design.

1.2 CONSTRUCTION WARRANTY MANAGEMENT

Prior to the end of the one year warranty, the Government may conduct an infrared roof survey on any project involving a membrane roofing system. This survey will be conducted in accordance with ASTM C1153-97 (R 2003e1), "Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging". The Contractor shall replace all damaged materials and locate and repair sources of moisture penetration.

1.2.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in Section 00 72 00 CONTRACT CLAUSES. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to

which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. Information to be turned over to a privatized Utility Contractor shall be separately bound. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

- a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact, telephone numbers and e-mail addresses within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.
- b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.
- c. A list for each warranted equipment, item, feature of construction or system indicating:
 1. Name of item.
 2. Model and serial numbers.
 3. Location where installed.
 4. Name and phone numbers of manufacturers or suppliers.
 5. Names, addresses, e-mail addresses and telephone numbers of sources of spare parts.
 6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
 7. Cross-reference to warranty certificates as applicable.
 8. Starting point and duration of warranty period.
 9. Summary of maintenance procedures required to continue the warranty in force.
 10. Cross-reference to specific pertinent Operation and Maintenance manuals.
 11. Organization, names, 24-hour emergency phone numbers and e-mail addresses of persons to call for warranty service.
 12. Typical response time and repair time expected for various warranted equipment.

- d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.
- e. Procedure and status of tagging of all equipment covered by extended warranties.
- f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.2.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction period.

- a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.
- b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.
- c. Following oral or written notification by the Contracting Officer or his representative of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.2.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number, e-mail address and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact shall be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this contract.

NOTE: Local service area is defined as the area in which the Contractor or his representative can meet the response times as described in Paragraph 1.2.4 below and in any event shall not exceed 200 miles radius of the construction site.

1.2.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Government or utility owner, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period within two working days of repair completion. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. Interim status reports shall be submitted weekly on repairs that have not yet been completed. If the Contractor does not perform the construction warranty work within the timeframes specified, the Government will perform the work and backcharge the Contractor.

- a. First Priority Code 1 - Safety/Life & Health/Emergency: Perform onsite inspection to evaluate situation and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

Air Conditioning Systems:

1. Recreational support.
2. Air conditioning leak in part of building, if causing damage.
3. Air conditioning system not cooling properly.
4. Telecom Rooms (TR)

Doors:

1. Overhead doors not operational, causing a security, fire, or safety problem.
2. Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.
3. All exterior doors, doors in connecting corridor.

Electrical:

1. Power failure (entire area or any building operational after 1600 hours).
2. Emergency Egress and Security Lighting.
3. Smoke detectors and fire alarm systems.
4. Treatment Rooms.
5. Telecom Rooms (TR).

Mass Notification System (MNS):

1. Software deficiency makes system inoperative.

Nurse Call System:

1. Software deficiency makes system inoperative.

Public Address System:

1. Software deficiency makes system inoperative.

Gas:

1. Leaks and breaks.
2. No gas to family housing unit or cantonment area.

Heat:

1. Area power failure affecting heat.
2. Heater in unit not working.

Intrusion Detection Systems:

1. SFFC Addition and BHC.

Refrigeration:

1. HVAC.

Roof Leaks:

1. Temporary repairs shall be made where major damage to property is occurring.

Sprinkler System:

1. All sprinkler systems, valves, manholes, deluge systems, and air systems to sprinklers.

Water (Exterior):

1. No water to a building with sanitary facilities.
2. Broken water main.

Water, Hot (and Steam):

1. SFCC Addition and BHC.

Sewage System:

1. Sewage line backup.
2. Broken sanitary or storm sewer main

- b. Second Priority Code 2 - Property Damage/Severe Inconvenience/Urgent:
Perform onsite inspection to evaluate situation and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

Air Conditioning Systems:

1. Areas other than telecom rooms.

Doors:

1. All other interior doors.

Electrical:

1. Power failure (no power to a room or part of building).
2. Receptacle and lights, exit lights or emergency lights (in a room or part of building).
3. Traffic signal inoperable (flashing).

Kitchen Equipment:

1. Dishwasher not operating properly.
2. Any other equipment hampering preparation of a meal.

Plumbing:

1. Flush valves not operating properly.
2. Fixture drain, supply line to commode, or any water pipe leaking.
3. Commode leaking at base.

Roof Leaks:

1. Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Water (Exterior):

1. No water to facility.

Water, Hot (and Steam):

1. No hot water in portion of building listed under Code 1.

Sewage System:

1. Pipe blocked in individual restrooms.

- c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

Doors:

1. Overhead doors not operational.
2. Interior/exterior personnel doors or hardware not functioning properly.

Electrical:

1. Street, parking area lights.

Plumbing:

1. Leaky faucets.

Interior:

1. Floors damaged.
2. Paint chipping or peeling.

3. Casework.
4. Flood damage due to workmanship or equipment provided by contract.

Other:

1. All other work not listed above.

The applicable priority (Code 1, 2, or 3) from the Warranty Service priority list will be determined by the Government in its sole discretion.

Should parts be required to complete the work and the parts are not immediately available, the Contractor shall have a maximum of 12 hours after arrival at the job site to provide the Government, with firm written proposals for emergency alternatives and temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractor's proposals shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair. The Government will evaluate the proposed alternatives and negotiate the alternative considered to be in the best interest of the Government to reduce the impact of the emergency condition. Alternatives considered by the Government will include the alternative for the Contractor to "Do Nothing" while waiting until the required parts are available to perform permanent warranty repair. Negotiating a proposal which will require Government participation and the expenditure of Government funds shall constitute a separate procurement action by the using service.

1.2.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information:

- a. Type of product/material _____.
- b. Model number _____.
- c. Serial number _____.
- d. Contract number _____.
- e. Warranty period _____ from _____ to _____.
- f. Contractor Inspector's (QC) signature _____.
- g. Construction Contractor _____.
- Address _____.
- Telephone number _____.
- E-mail address _____.
- h. Warranty contact _____.
- Address _____.
- Telephone number _____.
- E-mail address _____.
- i. Warranty response time priority code _____.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1609	(2001) Development and Implementation of a Pollution Prevention Program
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U.S. GREEN BUILDING COUNCIL (USGBC)

LEED	(2007) Leadership in Energy and Environmental Design(tm) Green Building Rating System for New Construction (LEED-NC)
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1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. A minimum of 50 percent by weight of total project solid waste shall be diverted from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program in accordance with ASTM E 1609 and as specified. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity

acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor is responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G, ; (LEED)

SD-11 Closeout Submittals

Records; (LEED)

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 01 - CONTRACTOR QUALITY CONTROL. At a minimum, environmental and waste management goals and issues shall be discussed at the following additional meetings:

- a. Pre-bid meeting.
- b. Preconstruction meeting.
- c. Regular site meetings.
- d. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

A waste management plan shall be submitted within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan shall demonstrate how the project waste diversion goal shall be met and shall include the following:

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management.
- b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
- c. Description of the regular meetings to be held to address waste management.
- d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
- e. Characterization, including estimated types and quantities, of the waste to be generated.
- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.
- h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.
- i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.
- j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.
- k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

- I. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and using the LEED Letter Template. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be included in the LEED Documentation Notebook.

Demolition accomplished by other parties on this project site count toward the project's total waste diversion cumulative score for LEED. Information on the quantity and disposition of these materials will be provided by the Contracting Officer. Include this data in records, annotated to indicate that it was accomplished by another party.

1.8 REPORTS

Provide quarterly reports and a final report to the Contracting Officer. Quarterly and final reports shall include project name, information for waste generated this quarter, and cumulative totals for the project. Each report shall include supporting documentation to include manifests, weight tickets, receipts, and invoices specifically identifying the project and waste material. Include timber harvest and demolition information, if any.

1.9 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in

collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 20.00 10 - ENVIRONMENTAL PROTECTION. Separate materials by one of the following methods:

1.9.1 Source Separated Method

Waste products and materials that are recyclable shall be separated from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

- a. Land clearing debris.
- b. Asphalt.
- . Concrete and masonry.
- d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).
 - 1. Ferrous.
 - 2. Non-ferrous.
- e. Wood (nails and staples allowed).
- f. Debris.
- g. Glass (colored glass allowed).
- h. Paper.
 - 1. Bond.
 - 2. Newsprint.
 - 3. Cardboard and paper packaging materials.
- i. Plastic.

1. Type 1: Polyethylene Terephthalate (PET, PETE).
2. Type 2: High Density Polyethylene (HDPE).
3. Type 3: Vinyl (Polyvinyl Chloride or PVC).
4. Type 4: Low Density Polyethylene (LDPE).
5. Type 5: Polypropylene (PP).
6. Type 6: Polystyrene (PS).
7. Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

j. Gypsum.

k. Non-hazardous paint and paint cans.

l. Carpet.

m. Ceiling tiles.

n. Insulation.

o. Beverage containers.

1.9.2 Co-Mingled Method

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

1.9.3 Other Methods

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.10 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.10.1 Reuse

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Reuse materials as indicated on the drawings. Sale or donation of waste suitable for reuse shall be considered.

1.10.2 Recycle

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling. All fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site shall be recycled. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

1.10.3 Compost

Consider composting on site if a reasonable amount of compostable material will be available. Compostable materials include plant material, sawdust, and certain food scraps.

1.10.4 Waste

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

1.10.5 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 78 02.00 10

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1971	(2005) Stewardship for the Cleaning of Commercial and Institutional Buildings
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GREEN SEAL (GS)

GS-37	(2000; R 2005) Industrial and Institutional Cleaners
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

As-Built Record of Equipment and Materials

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

List of Completed Clean-up Items

SD-05 Design Data

LEED Documentation

GIS Documentation

SD-10 Operation and Maintenance Data

Submit Operation and Maintenance Manuals in accordance with paragraph entitled, "Operation and Maintenance," of this section

SD-11 Closeout Submittals

As-Built Drawings

Drawings showing final as-built conditions of the project. The final CADD record drawings must consist of one set of electronic CADD drawing files in the specified format, 2 sets of full-size prints, and one set of the approved working Record drawings.

Certification of EPA Designated Items; G

Form DD1354; G

Checklist for Form DD1354; G

Record Construction Contract Specifications

1.3 PROJECT RECORD DOCUMENTS

1.3.1 As-Built Drawings

It is the scope of this section to provide guidance to the DB Contractor on preparing as-built drawings for design-build projects. An as-built drawing is a construction drawing revised to reflect the final as-built conditions of the project as a result of modifications and corrections to the project design required during construction. The final as-built drawings shall not have the appearance of marked up drawings, but that of professionally prepared drawings as if they were the "as designed" drawings.

1.3.2 Maintenance of As-Built Drawings

The Contractor's Configuration Management Plan shall describe how the Contractor will maintain up-to-date drawings, how it will control and designate revisions to the drawings and specifications (in accordance with Special Contract Requirement: DEVIATING FROM THE ACCEPTED DESIGN and Section 01 33 16 DESIGN AFTER AWARD, the Designer of Record's approval is necessary for any revisions to the accepted design.

The DB Contractor shall make timely updates, carefully maintaining a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the contract drawings. The DB Contractor shall enter changes and corrections

on drawings promptly to reflect "Current Construction". This update shall be done no less frequently than on a weekly basis for the blue line drawings and update no less frequently than a quarterly basis for the CADD files, which were prepared previously in accordance with Section 01 33 16 DESIGN AFTER AWARD. The Contractor shall include a confirmation that the as-builts are up to date with the submission of the monthly project schedule.

If the DB Contractor fails to maintain the as-built drawings as required herein, the Contracting Officer will retain from the monthly progress payment, an amount representing the estimated monthly cost of maintaining the as-built drawings. Final payment with respect to separately priced facilities or the contract as a whole, will be withheld until the Contractor submits acceptable as-built drawings and the Contracting Officer approves them.

The marked-up set of drawings shall reflect any changes, alterations, adjustments or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design.

Typically, room numbers shown on the contract drawings are selected for design convenience and do not represent the actual numbers intended for use by the end user. Final as-built drawings shall reflect actual room numbers adopted by the end user.

The Government will withhold the amount of \$35,000, or 1% of the present construction value, whichever is the greater, until the final as-built drawing submittal has been approved by the Government.

1.3.3 Underground Utilities

The drawings shall indicate, in addition to all changes and corrections, the actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average elevation of the top of each run or underground structure shall also be recorded.

1.3.4 Partial Occupancy

For projects where portions of construction are to be occupied or activated before overall project completion, including portions of utility systems, as-built drawings for those portions of the facility being occupied or activated shall be supplied at the time

the facility is occupied or activated. This same as-built information previously furnished must also be shown on the final set of as-built drawings.

1.3.5 As-Built Conditions that are Different From the Contract Drawings

Accurately reflect all as-built conditions that are different, such as dimensions, road alignments and grades, and drainage and elevations, from the contract drawings on each drawing. If the as-built condition is accurately reflected on a shop drawing, then furnish that shop drawing in CADD format. Reference the final as-built construction drawing the shop drawing file that includes the as-built information. In turn, the shop drawing shall reference the applicable construction as-built drawing. Delete any options shown on drawings and not selected clearly reflect options selected on final as-built drawings.

1.3.6 Additional As-Built Information that Exceeds the Detail Shown on the Contract Drawings

These as-built conditions include those that reflect structural details, foundation layouts, equipment, sizes, mechanical and electrical room layouts and other extensions of design, that were not shown in the project design documents because the exact details were not known until after the time of approved shop drawings. It is recognized that these shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the contract drawings. Furnish all such shop drawings in CADD format. Include fire protection details, such as wiring, piping, and equipment drawings. Include locations of all explorations, logs of all explorations, and results of the laboratory testing, including those provided by the Government, performed for the design of the project.

1.3.7 Final As-Built Drawings

At the time of Beneficial Occupancy of the project or at a designated phase of the project, provide final as-built CADD files to the Contracting Officer to include in the following:

- a. CD-ROM in the format as specified in Section 01 33 16 DESIGN AFTER AWARD.
- b. Three full hard copy sets.
- c. The record set of approved working as-built drawings.

In the event the DB Contractor accomplishes additional work after this submittal, which changes the as-built conditions, the DB Contractor shall furnish a new CD-ROM with all drawing sheets, new full size set of reproducible Mylars of affected sheets, and new blue line copy of affected sheets which depict additional changes.

1.3.8 Title Blocks

In accordance with the configuration management plan, clearly mark title blocks to indicate final as-built drawings.

1.3.9 As-Built Record of Equipment and Materials

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 7 days after final inspection with Government comments. Submit 2 sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification	Manufacturer	Composition	Where
	Section	and Catalog,	and Size	Used
		Model, and		
		Serial Number		

1.3.10 Final Approved Shop Drawings

Furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.3.11 Record Construction Contract Specifications

Furnish final record (as-built) construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.3.12 Other As-Built Documents

Provide scans of all other documents such as design analysis, catalog cuts, certification documents that are not available in native electronic format in an organized manner in Adobe PDF format.

1.3.12.1 LEED Documentation

Update LEED documentation on at least a monthly basis and have it available for review by the Government on the jobsite at all times during construction. Submit the final LEED Project Checklist(s), final LEED submittals checklist and complete project documentation, verifying the final LEED score and establishing the final rating. For USGBC certification projects, submit all documentation and USGBC formal ruling. Provide full support to the certification review process, including USGBC credit audits.

1.3.12.2 GIS Documentation

Provide final geo-referenced GIS database of the new building footprint along with any changes made to exterior of the building. The intent of capturing the final building footprint and exterior modifications in a GIS database is to provide the installation with a data set of the comprehensive changes made to the landscape as a result of the construction project. This data set will be incorporated into the installations existing GIS Masterplan or Enterprise GIS system. The GIS database deliverable shall follow a standard template provided to the Contractor by the Government, adhere to detailed specifications outlined in ECB No 2006-15, and be documented using the Federal Geographic Data Committee (FGDC) metadata standard.

1.3.13 Final Payment

No separate or direct payment will be made for the work specified herein. Include all costs associated with this work in the applicable contract prices for the items requiring as-built drawings.

1.4 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials: 1) The product does not meet appropriate performance standards; 2) The product is not available within a reasonable time frame; 3) The product is not available competitively (from two or more sources); 4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)." Record each product used in the project that has a requirement or option of containing recycled content in accordance with Section 01 62 35 - RECYCLED/RECOVERED MATERIALS, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

1.5 TESTING, ADJUSTING, BALANCING AND COMMISSIONING

Submit all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning prior to final inspection and transfer for approval as specified in applicable technical specification sections.

1.5.1 Government Witnessing and Scheduling of Testing

The Contractor shall notify the Contracting Officer, by serial letter, of dates and agenda of all performance testing of the following systems: mechanical (including fire protection and EMCS), electrical (including fire protection) medical and food service systems a minimum of 10 calendar days prior to start of such testing. In this notification, the Contractor shall certify that all equipment, materials, and personnel necessary to conduct such testing will be available on the scheduled date and that the systems have been prechecked by him and are ready for performance and/or acceptance testing. Contractor shall also confirm that all operations and maintenance manuals have been submitted and approved. **NO PERFORMANCE AND/OR ACCEPTANCE TESTING WILL BE PERMITTED UNTIL THE OPERATIONS AND MAINTENANCE MANUALS HAVE BEEN APPROVED.**

Government personnel, at the option of the Government, will travel to the site to witness testing. If the testing must be postponed or canceled for whatever reason not the fault of the Government, the Contractor shall provide the Government not less than 3 working days advance notice (notice may be faxed) of this postponement or cancellation. Should this 3 working day notice not be given, the Contractor shall reimburse the Government for any and all out of pocket expenses incurred for making arrangements to witness such testing including, but not limited to airline, rental car, meal, and lodging expenses. Should testing be conducted, but fail and have to be rescheduled for any reason not the fault of the Government, the Contractor shall similarly reimburse the Government for all expenses incurred.

1.6 OPERATION AND MAINTENANCE MANUALS

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Submit Operations and Maintenance Manuals in accordance with Section 01 78 23. Contractor shall ensure that all of the requirements are met to the satisfaction of Contracting officer. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.7 PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY

Promptly furnish and shall require any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, except prices do not need to be provided for Government-Furnished Property.

1.8 LEED REVIEW MEETINGS

Pre-Closeout Meeting: Approximately 30 days before submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the documentation, determine which, if any, credits will be audited and identify any corrections/missing items prior to the closeout LEED documentation submittal. USGBC certification projects use USGBC for determination of achievement of credits, satisfactory documentation and final score. For USGBC certification projects a LEED pre-closeout meeting is not required, but Contractor may request a pre-closeout review meeting at any time.

Approximately 14 days after submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the LEED closeout documentation. The review conference will include discussion of and resolution of all review comments to ensure consensus on achievement of credits and satisfactory documentation. At the review conference a final score will be determined and endorsed in writing by all parties. USGBC certification projects use USGBC for determination of achievement of credits, satisfactory documentation and final score. For USGBC certification projects a LEED review meeting is not required but is recommended as a general review.

1.9 RED ZONE MEETING

Approximately 60 days before the anticipated Beneficial Occupancy Date (BOD), the Contractor and the Government's project delivery team will conduct what is known as the Red Zone Meeting to discuss the close-out process, to schedule the events and review responsibilities for actions necessary to produce a timely physical, as well as fiscal, project close-out. The Red Zone meeting derives its name from the football term used to describe the team effort to move the ball the last 20 yards into the end zone. The close-out of a construction project sometimes can be equally as hard and most definitely requires the whole team's efforts. The ACO will chair the meeting. Attachment 01 78 00-A is a generic meeting checklist.

1.10 FINAL CLEANING

Provide final cleaning in accordance with ASTM E 1971. Leave premises "broom clean". Comply with GS-37 for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with the Waste Management Plan. Promptly and legally transport and dispose of any trash. Do not burn, bury, or otherwise dispose of

trash on the project site. Submit a list of completed clean-up items on the day of final inspection.

1.11 REAL PROPERTY RECORD

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft attached to this section, and submit an accounting of all installed property on Form DD1354 "Transfer and Acceptance of Military Real Property." Contact the Contracting Officer for any project specific information necessary to complete the Form DD1354. For information purposes, a blank Form DD1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site:

<http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf>

Submit the completed Checklist for Form DD1354 of Government-Furnished and Contractor-Furnished/Contractor Installed items. Attach this list to the updated Form DD1354. Instructions for completing the form and a blank checklist (fill-able) in ADOBE (PDF) may be obtained at the following web site:

http://www.wbdg.org/ccb/DOD/UFC/ufc_1_300_08.pdf

See Appendix D of this pdf for the checklist.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 78 23

OPERATIONS AND MAINTENANCE MANUALS

PART 1 GENERAL

1.1 SUBMITTALS

Submit the following in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-10 Operation and Maintenance Data

Operations and Maintenance (O&M) Manuals; G

O&M Manual Check List; G

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor shall provide Operations and Maintenance (O&M) manuals for the complete project as applicable under this contract, including all Contractor furnished and installed equipment, systems and materials, and all Government furnished- Contractor installed equipment, systems and materials. Included herein are requirements for compiling and submitting the O&M data. Additional O&M data requirements are specified in the individual sections of the technical specifications. O&M Manual requirements shall be coordinated with the requirements as stated in the other technical specification sections and shall include listings for spare parts, framed instructions, etc.

Inasmuch as the operations and maintenance manuals are required to operate and maintain the facility, the operations and maintenance (O&M) manuals will be considered a requirement prior to substantial completion of any facility to be turned over to the Government. Beneficial occupancy of all or portions of a facility prior to substantial completion will not relieve the Contractor of liquidated damages, if substantial completion exceeds the required completion date.

Manual preparation shall be under the direction of an individual or organization that has demonstrated expertise in the preparation of comprehensive and complete O&M manuals. As a minimum, responsible person shall have personally prepared, or

personally been responsible for the preparation of, sets of O&M manuals on 3 projects of similar size and complexity. Qualifications shall be submitted for Contracting Officer approval within 30 calendar days of contract Notice to Proceed. Qualifications shall include a list of projects for which this individual or organization has prepared manuals in the past, and include such pertinent data as the project description, size, and points of contact to determine quality of manuals prepared.

Provide one permanent electronic copy on CD-ROM and two hard copies of the Equipment Operating, Maintenance, and Repair Manuals. Provide separate manuals for each utility system as defined hereinafter. Submit Operations and Maintenance manuals for approval before field training or 90 days before substantial completion (whichever occurs earlier). If there is no separate CLIN for O&M Manuals, the Government will withhold an amount representing \$75,000, as non-progressed work, until submittal and approval of all O&M manuals are complete.

3.2 DEFINITIONS

- a. Equipment: A single piece of equipment operating alone or in conjunction with other equipment to accomplish a system function.
- b. System: A combination of one or more pieces of equipment which function together to accomplish an intended purpose (i.e. HVAC system is composed of many individual pieces of equipment such as fans, motors, compressors, valves, sensors, relays, etc.)

3.3 HARD COVER BINDERS

The manuals shall be hard cover with posts, or 3-ring binders, so sheets may be easily substituted. Print the following identification on the cover: the words "EQUIPMENT OPERATING, MAINTENANCE, AND REPAIR MANUALS," the project name, building number, and an indication of utility or systems covered, the name of the Contractor, and the Contract number. Manuals shall be approximately 8-1/2 by 11-inches with large sheets folded in and capable of being easily pulled out for reference. All manuals for the project must be similar in appearance, and be of professional quality.

3.4 WARNING PAGE

Provide a warning page to warn of potential dangers (if they exist, such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, high pressures, etc.). Place the warning page inside the front cover and in front of the title page. Include any necessary Material Safety Data Sheets (MSDS) here.

3.5 TITLE PAGE

The title page shall include the same information shown on the cover and show the name of the preparing firm and the date of publication.

3.6 TABLE OF CONTENTS

Each volume of the set of manuals for this project shall include a table of contents, for the entire set, broken down by volume.

3.7 FORMAT

Organize manuals according to the following format, and include information for each item of equipment. Submit a draft outline and table of contents for approval at 50% contract completion.

TABLE OF CONTENTS

PART I: Introduction

- a. Equipment Description
- b. Functional Description
- c. Installation Description

PART II: Operating Principles

PART III: Safety

PART IV: Preventative Maintenance

- a. Preventative Maintenance Checklist, Lubrication
- b. Charts and Diagrams

PART V: Spare Parts Lists

- a. Troubleshooting Guide
- b. Adjustments
- c. Common Repairs and Parts Replacement

PART VI: Illustrations

3.7.1 Part I-Introduction

Part I shall provide an introduction, equipment or system description, functional description and theory of operation, and installation instructions for each piece of equipment. Include complete instructions for uncrating, assembly, connection to the power source and pre-operating lubrication in the installation instructions as applicable. Illustrations, including wiring and cabling diagrams, are required as

appropriate in this section. Include halftone pictures of the equipment in the introduction and equipment description, as well as system layout drawings with each item of equipment located and marked. Do not use copies of previously submitted shop drawings in these manuals.

3.7.2 Part II-Operating Principles

Part II shall provide complete instructions for operating the system, and each piece of equipment. Illustrations, halftone pictures, tables, charts, procedures, and diagrams are required when applicable. This will include step-by-step procedures for start-up and shutdown of both the system and each component piece of equipments, as well as adjustments required to obtain optimum equipment performance, and corrective actions for malfunctions. Show performance sheets and graphs showing capacity data, efficiencies, electrical characteristics, pressure drops, and flow rates here, also. Marked-up catalogs or catalog pages do not satisfy this requirement. Present performance information as concisely as possible with only data pertaining to equipment actually installed. Include actual test data collected for Contractor performance here.

3.7.3 Part III-Safety

Part III shall contain the general and specific safety requirements peculiar to each item of equipment. Repeat safety information as notes cautions and warnings in other sections where appropriate to operations described.

3.7.4 Part IV-Preventive Maintenance

Part IV shall contain a troubleshooting guide, including detailed instructions for all common adjustments and alignment procedures, including a detailed maintenance schedule. Also include a diagnostic chart showing symptoms and solutions to problems. Include test hookups to determine the cause, special tools and test equipment, and methods for returning the equipment to operating conditions. Information may be in chart form or in tabular format with appropriate headings. Include instructions for the removal, disassembly, repair, reassembly, and replacement of parts and assemblies where applicable and the task is not obvious.

3.7.5 Part V-Spare Parts List

Part V shall contain a tabulation of description data and parts location illustrations for all mechanical and electrical parts. The heading of the parts list shall clearly identify the supplier, purchase order number, and equipment. Include the unit price for each part. List parts by major assemblies, and arrange the listing in columnar form. Include names and addresses of the nearest manufacturer's representatives, as well as any special warranty information. Provide a list of spare parts that are recommended to be kept in stock by the Government installation.

3.7.6 Part VI-Illustrations

Part VI shall contain assembly drawings for the complete equipment or system and for all major components. Include complete wiring diagrams and schematics. Other illustrations, such as exploded views, block diagrams, and cutaway drawings, are required as appropriate.

3.8 FRAMED INSTRUCTIONS

Post framed instructions are required for substantial completion. Post framed instructions under glass or in laminated plastic, including wiring and control diagrams showing the complete layout of the entire system, including equipment, ductwork, piping valves, dampers, and control sequence at a location near the equipment described. Prepare condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation, valve schedule and procedures for safely starting and stopping the system in type form, framed as specified above for the wiring and control diagrams and posted beside the diagrams. Submit proposed diagrams, instructions, and other sheets prior to posting. Post the framed instructions before field training.

3.9 PAYMENT

Payment will be made at the contract lump sum price for O&M Manuals; payment of which shall constitute full compensation of that item complete. No partial or total payment will be made for this item until all O&M manuals are fully approved by the Government (A or B action) and all copies of final manuals are received by the Government in their final binders.

3.10 FILE FORMAT FOR ELECTRONIC MANUAL

The organization and format of the electronic O&M manuals should support the requirements of the project for design, construction, bidding and archiving. The electronic O&M manuals shall readily support the integration of information into preventative maintenance management software application systems with minimal effort by including a separate, electronically formatted spreadsheet as described in Paragraph PREVENTATIVE MAINTENANCE DATA SPREADSHEET.

3.10.1 Folder and File Requirements

Final electronic O&M folders and files shall meet the following requirements:

- a. Folder name shall match product name.
- b. If sub-folders are required, names shall match specific product component name.
- c. File names shall match product component titles.

d. 100% Complete O&M Documents.

Final electronic O&M manual shall be provided in PDF file format with a table of contents and cover sheet. To create PDF:

- a. File names shall only include alpha (A-Z or a-z), numeric (0-9), spaces and the these special characters:

-_=()^|:

- b. The file names shall not use a dash - or a space as the last character of the file name.
- c. PDF files shall not exceed 10MB and may need to be divided into separate volumes. Break volumes at logical breaking points i.e. between divisions. Cover sheet shall note volume and divisions included. Use Standard NPS Cover Sheet.
- d. Each O&M manual volume shall be an individual file.
- e. Each O&M manual volume shall have a Table of Contents (CSI Division Title, Section Number, Section Title, and number of pages per Section).

3.10.2 Preventative Maintenance Data Spreadsheet

All electronic O&M Manuals shall include an electronic spreadsheet (MS Excel compatible). The worksheets within the spreadsheet shall present searchable and sortable tables where each installed device shall be listed by row. As a minimum, each table shall contain the following:

3.10.2.1 Worksheet One

Worksheet One shall present Table One where each device's name, site, building, floor, room, and department shall be accurately recorded. Worksheet One shall be titled "Equipment Locations" and shall have columns A through F renamed to the following:

- A - Device Name
- B - Site
- C - Building
- D - Floor
- E - Room
- F - Department

3.10.2.2 Worksheet Two

Worksheet Two shall present Table Two where each device's Name, Equipment No., Description, Serial No., Model No., and Manufacturer shall be accurately recorded. Worksheet Two shall be titled "Additional Equipment Fields" and shall have columns A through F renamed to the following:

- A - Device Name
- B - Equipment No
- C - Description
- D - Serial No
- E - Model No
- F - Manufacturer

3.10.2.3 Worksheet Three

Worksheet Three shall present Table Three where each device's Name, Task Description, Scheduled Start Date, and Status shall be accurately recorded. Worksheet Three shall be titled "Work Order Fields" and shall have columns A through D renamed to the following:

- A - Device Name
- B - Task Description
- C - Scheduled Start Date
- D - Status

3.10.3 Media Requirements

All electronic O&M Manuals shall be copied to CD ROM(s). Deliver individual CD ROMs in Clear Slim Jewel Cases unless otherwise specified. When submissions consist of 2 or more CD ROMs, each CD ROM shall be numbered sequentially, including the total number of CD ROMs in the submission (i.e. 3 of 6). CD ROM(s) shall be formatted single session; finalized disk; Joliet or ISO 9660 Level 2 file system and clearly labeled (electronically printed) with the following project information:

- a. O&M manual Title and Volume Number
- b. Recipient
- c. Project Title
- d. Location
- e. Date submitted (i.e. December 14, 2004)
- f. Name of A/E Prime Contractor

3.11 SYSTEM/EQUIPMENT REQUIREMENTS

3.11.1 Facility Heating System

Provide information on the following equipment: boilers, water treatment, chemical feed pumps and tanks, converters, heat exchangers, pumps, unit heaters, fin-tube radiation, air handling units (both heating only and heating and cooling), and valves (associated with heating systems).

3.11.2 Air-Conditioning Systems

Provide information in chillers, packaged air-conditioning equipment, towers, water treatment, chemical feed pumps and tanks, air-cooled condensers, pumps, compressors, air handling units, and valves (associated with air-conditioning systems).

3.11.3 Temperature Control and HVAC Distribution Systems

Provide all information described for the following equipment: valves, fans, air handling units, pumps, boilers, converters and heat exchangers, chillers, water cooled condensers, cooling towers, and fin-tube radiation, control air compressors, control components (sensors, controllers, adapters and actuators), and flow measuring equipment.

3.11.4 Central Heating Plants

Provide the information described for the following equipment: boilers, converters, heat exchangers, pumps, fans, steam traps, pollution control equipment, chemical feed equipment, control systems, fuel handling equipment, de-aerators, tanks (flash, expansion, return waters, etc.), water softeners, and valves.

3.11.5 Heating Distribution Systems

Provide the information described for the following equipment: valves, fans, pumps, converters and heat exchangers, steam traps, tanks (expansion flash, etc.), and piping systems.

3.11.6 Exterior Electrical Systems

Provide information on the following equipment: power transformers, relays, reclosers, breakers, and capacitor bank controls.

3.11.7 Interior Electrical Systems

Provide information on the following equipment: relays, motor control centers, switchgear, solid state circuit breakers, motor controller, EPS lighting systems, wiring

diagrams and troubleshooting flow chart on control systems, and special grounding systems.

3.11.8 Energy Monitoring and Control Systems

The maintenance manual shall include descriptions of maintenance for all equipment, including inspection, periodic preventative maintenance, fault diagnosis, and repair or replacement of defective components.

3.11.9 Domestic Water Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentation, laboratory test equipment, chemical feeders, valves, switching gear, and automatic controls.

3.11.10 Wastewater Treatment Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentations, laboratory test equipment chemical feeders, valves, scrapers, skimmers, comminutors, blowers, switching gear, and automatic controls.

3.11.11 Fire Protection Systems

Provide information on the following equipment: alarm valves, manual valves, regulators, foam and gas storage tanks, piping materials, sprinkler heads, nozzles, pumps, and pump drivers.

3.11.12 Fire Alarm and Detection Systems

- a. The maintenance manual shall include description of maintenance for all equipment, including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.
- b. Provide all software; database with complete identification of programmable portions of system equipment and devices, and all other system programming data on all modes of the system; connecting cables; and proprietary equipment necessary for the operation, maintenance, testing, repair and programming, etc. of the system and that may be required for implementation of future changes to the fire system (additional and/or relocated initiating devices, notification devices, etc.
- c. Provide all system and equipment technical data and computer software with the requisite rights to Government use, in accordance with the applicable contract clauses.

- d. Training shall include software and programming required for the effective operation, maintenance, testing, diagnostics and expansion of the system.

3.11.13 Plumbing Systems

Provide information on the following equipment: water heaters, valves, pressure regulators backflow preventors, piping materials, and plumbing fixtures.

3.11.14 Liquid Fuels Systems

Provide information on the following equipment: tanks, automatic valves manual valves, filter separators, pumps, mechanical loading arms, nozzles, meters, electronic controls, electrical switch gear, and fluidic controls.

3.11.15 Cathodic Protection Systems

Provide information on the following material and equipment: rectifiers, meters, anodes, anode backfill, anode lead wire, insulation material and wire size, automatic controls (if any), rheostats, switches, fuses and circuit breakers, type and size of rectifying elements, type of oil in oil-immersed rectifiers, and rating of shunts.

3.11.16 Generator Installations

Provide information on the following equipment: generator sets, automatic transfer panels, governors, exciters, regulators starting systems, switchgear, and protective devices.

3.11.17 Miscellaneous Systems

Provide information on the following: communication and ADP systems, security and intrusion alarm, elevators, material handling, active solar, photovoltaic, nurse call, paging, intercom, closed circuit TV, irrigation, sound and material delivery systems, kitchen, refrigeration, disposal, ice making equipment, and other similar type special systems not otherwise specified.

3.11.18 Laboratory, Environmental and Pollution Control Systems

Provide information on the following equipment: wet scrubbers, quench chambers, scrub tanks, liquid oil separators, and fume hoods.

3.12 REAL PROPERTY INSTALLED EQUIPMENT INVENTORY (RPIE)

3.12.1 O & M Database

Develop a database from the O&M manuals that contains the information required to start a preventative maintenance program. The Government shall make available

software and/or templates to complete data entry compatible with the Defense Medical Logistic Standard Support - Facility Management (DMLSS-FM) Computer Maintenance Management System (CMMS).

3.12.2 RPIE Inventory Data Entry

The Contractor shall complete a Real Property Installed Equipment (RPIE) inventory of the complete facility and input data into DMLSS/CMMS. Data entry shall be at a minimum:

- a. Facility Number (coordinate with Government for correct number)
- b. Room Number
- c. Room Name
- d. RPIE ID/Index Number (as approved by Government)
- e. Barcode Number
- f. Facility Subsystem
- g. Nomenclature
- h. Condition (condition at date of acceptance by Government)
- i. Condition Date (date of acceptance by Government)
- j. RPIE Specifications:
 1. Volts
 2. Amps
 3. Phase
 4. Hz
 5. Hp
 6. KVA
 7. KW
 8. Frame
 9. RPM
 10. CFM
 11. Ton
 12. BTU
 13. PSI
 14. GPM
 15. Refrigerant
 16. Belt Size
 17. Filter Size
- k. Manufacturer's Data Manufacturer Model Number Serial Number
- l. Installation and Warranty Information, Installation Date Life Expectancy Warranty, Start Labor Warranty, and Parts Warranty
- m. Contractor shall propose hierarchical relationships (grouping, parent-child, etc.) for inputting of equipment into DMLSS System.
- n. Entry of nameplate data that is in addition to the RPIE specifications above.
- o. Development of manufacturer's required preventative maintenance (PM) task sheets with required task frequency.
- p. Development of required spare parts list in the inventory module.

- q. Assignment of PM tasks to applicable equipment.

3.12.3 Use of DMLSS-FM during Commissioning (Cx)

Enter data into DMLSS-FM prior to any Commissioning of equipment. Equipment data sheets shall be printed out from DMLSS-FM and be present during any Commissioning of any piece of equipment.

The Government will perform a National Agency Check investigation of all Contractor's personnel logging onto or entering data into DMLSS-FM. Assigned personnel shall have a working employee's security background investigations and comply with USAMHID DD 254 (Department of Defense).

3.12.4 Type of Information Required in O&M Data Packages

- a. Preventive Maintenance. Enter into DMLSS-FM and check preventative maintenance (PM) procedures for maintaining all RPIE items inventoried. Also, enter all associated maintenance schedules and preventative maintenance procedures for all RPIE items. Assign all RPIE items a preventative maintenance schedule and preventative maintenance procedures.

Maintain all installed equipment in accordance with manufacturer's specifications and recommendations until such time as the Government accepts the building. Record maintenance in DMLSS-FM.

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1. Lubrication Data. Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements": (a) A table showing recommended lubricants for specific temperature ranges and applications, (b) Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities, and (c) A lubrication Schedule showing service interval frequency.
2. Preventive Maintenance Plan and Schedule. Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

3.13 FIELD TRAINING

Field Training is a requirement for substantial completion. Conduct a training course for the operating staff for each particular system. Conduct the training during hours of normal working time after the system is functionally complete. The field instructions shall cover all of the items contained in the Equipment Operating, Maintenance and Repair Manuals. The training will include both classroom and "hands-on" training. Submit a lesson plan outlining the information to be discussed during training periods. Submit this lesson plan for approval 90 days before contract completion before the field training occurs. Record training on DVD and furnish to the Government within ten (10) days following training. Document all training and furnish a list of all attendees.

3.14 CHECKLIST

Contractor shall complete and initial a copy of the O&M Manual Check List which is provided at the end of this section, and forwarded along with ENG form 4025 as part of the O&M Manual submittal to the Contracting Officer for approval.

3.15 CONTRACTOR PERFORMANCE RATING

Failure of the Contractor to submit the following data by the time frames required by the contract shall be cause for the Government to issue an interim unsatisfactory performance rating for the sub element of Adequacy of Submittals under main element, Quality Control, as well as for the sub element of Submission of Required Documentation under main element Timely Performance of DD Form 2626, Performance Evaluation (Construction).

- a. Qualifications of the manual preparer by the time frame specified in Paragraph 3.1.1.
- b. Submission of the preliminary O&M manuals by the time frame specified in Paragraph 3.2.

Submission and approval of O&M data prior to personnel training and/or acceptance testing of all systems requiring such training or testing per Paragraph 3.2.3.

Performance Evaluation Reports will be available to all DoD Contracting Officers for their use in determining Contractor Responsibility, in compliance with FAR 36.201, Evaluation of Contractor Performance.

Failure to furnish approved, bound manuals in the required quantity by final inspection shall be cause to issue final unsatisfactory performance ratings in these sub elements.

Contractors who submit the required materials in the required time frames will receive recognition by the Government in the way of Performance Ratings and/or Letters of Appreciation.

O&M MANUAL - REVIEW CHECKLIST

___ Does the manual cover all equipment furnished under the contract? (Review against equipment schedules on the drawings and/or equipment submittals.)

___ Does the manual clearly highlight all relevant portions or cross out all irrelevant portions of catalog data?

___ Does the manual contain operations data for the equipment? (Step-by-step operating instructions, start up procedures, sequences of operation, precautions.)

___ Does the manual contain maintenance and repair data for the equipment? (Lubrication, dismantling, assembly, adjustment, troubleshooting.)

___ Does the manual contain a separate maintenance schedule listed by frequency of occurrence?

___ Does the manual contain parts lists or parts catalogs for the equipment? Parts catalog or list

___ shall contain identification, part numbers, recommended parts to be stocked, and local source of parts.

___ Does the manual contain electrical connection diagrams?

___ Does the manual contain control and interlock system diagrams where applicable?

___ Is every page in the manual numbered and an index provided for ready reference to the data?

___ Is the cover hard (nonflexible) with the facility name, identification number, location, and

___ system embossed on both the spine and cover? Is the Contractor's name and address, and

___ the contract title and contract number embossed on the inside of the manual cover?

___ Is the binding screw posts or sliding post?

___ Is any of the manual data under the binding where it cannot be seen?

___ Do three sets of manuals contain all original data sheets and are others clearly legible?

___ Are system layout drawings provided? (Simplified diagrams for the system as installed.)

___ Are all drawings in the manual of such a size that requires one fold right to left, or if a larger size drawing, then inserted into a pocket in the manual?

Note that the above are common requirements to all contracts. Check the specific contract for additional information.

-- End of Section --